

## Abstracts

# Joint Meeting of the 30<sup>th</sup> Annual Scientific Meeting of the Royal College of Surgeons of Thailand and the 15<sup>th</sup> Asian Congress of Surgery, 21 - 23 July 2005

## BREAST

### Sentinel Lymph Node Biopsy in Breast Cancer at Ratchaburi Hospital

*Noppawat Samankatiwat, MD, Montian Marutkarakul, MD*  
Department of Surgery, Ratchaburi Hospital, Ratchaburi, Thailand

**Background:** Sentinel lymph node biopsy (SNB) in early breast cancer has recently been a standard practice in developed countries. The most beneficial impact is the reduction of unnecessary axillary lymph node dissection which results in the decrease of axillary complications. In the USA, the most widely used method is combined blue dye and isotope technique, which is also used at Siriraj Hospital, the pioneer performing SNB in Thailand. Although this method has increasingly been used in many centers, it is still far from a routine practice in the rural part as a result of unavailability of the isotope.

**Objective:** To evaluate feasibility of SNB by blue dye technique alone at Ratchaburi hospital, a regional referral center, in terms of identification rate and false negative rate.

**Methods:** Between August 2004 and June 2005, patients who were diagnosed with clinically node negative breast cancer were recruited to the study. The procedure was performed by two surgeons using isosulfan blue dye technique, and axillary dissection was completed thereafter. Identification and false negative rates were calculated.

**Results:** Sixteen patients were enrolled in this study. The mean age was 47.4 years (31-71 years). The average tumor size was 3.2 cm (0.7-5 cm). One patient underwent breast conservative surgery and 15 patients underwent MRM including 3 patients with TRAM flap reconstruction. The number of patients who had T1 and T2 lesion was 3 and 13 respectively. The sentinel lymph nodes of all patients were identified. The average number of sentinel

lymph nodes was 5.3 (1-10) and of other axillary lymph nodes was 9.8 (5-17). Only one patient had negative sentinel lymph node (0/7) and positive axillary lymph node (1/14) implying a 6.25% false negative rate.

**Conclusions:** Sentinel lymph node biopsy using solely isosulfan blue dye technique is applicable in the rural part of Thailand. The identification rate is as high as 100% with a false negative rate of 6.25%.

### Current Status of Sentinel Lymph Node Biopsy in Taiwan Breast Cancer Patients

*Tse-Jia Liu, MD*

Taoyuan Veterans Hospital, Taoyuan, Taiwan

**Background:** A collaborated clinical result from 16 institutes of sentinel lymph node biopsy in Taiwan breast cancer patients is presented.

**Material and Methods:** The first period of the clinical data collection was before July 2004 and second period data was after that. A questioner including tracer, SLN identification and harvested, SLN examination, false negative rate (FNR) and spared axillary lymph node dissection (ALND) case number was answered.

**Results:** A total of 2,905 females with clinical axilla negative breast cancer were collected from 16 hospitals, 11 in 1st period and additional 5 in 2nd period. Differences between 2 periods are the combined tracers of blue dye and isotope were used 40% up to 80%, 95% successful SLN biopsy rate was 50% up to 80%. Intra-operative SLN examination was carried on from 80% up to 93% and match to 95% permanent section rate was 30% up to 80%. Eight hospitals with initial FNR <7% decreased FNR into 4.1% while another 4 hospitals with initial FNR >7%

decreased into 0%. The hospitals with SLN biopsy > 100 cases experience had an average 3.8% FNR but the hospitals with <100 cases experience had an 8.2% FNR ( $p < 0.01$ ).

**Conclusions:** Using combined blue dye and isotope increased the successful SLN biopsy rate. Significant increased accuracy rate of intra-operative SLN examination was obtained when more experience accumulated. FNR will be within 5% when a breast surgeon having over 100 cases experience. Spared ALND is not recommended in the hospital with FNR >5%.

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### The Relationship between Body Mass Index and Mortality Rate of Breast Cancer in Songklanagarind Hospital

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*Chansanti Orawan, MD, Puttawibul Puttisak, MD*

Department of Surgery, Songklanagarind Hospital, Prince of Songkhla University, Hat-yai

**Background:** Many previous studies from Western countries have shown that obesity is associated with an increased risk of breast cancer but the effect of obesity on prognosis is not clear. In postmenopausal women, particularly the elderly, various measures of obesity have been positively associated with risk. In both pre-menopausal and postmenopausal breast cancer, the mechanisms by which body weight and obesity affect risk have been related to levels of estrogen, insulin and insulin-like growth factors (IGFs) in these women.

**Objective:** To assess the relationship between the body mass index (BMI) and breast cancer mortality.

**Methods:** The medical records of breast cancer patients were studied retrospectively. From January 1, 1994 to December 31, 2002, there were 1,153 cases with complete record. Body weight and height at the time of diagnosis and patient status (i.e., alive and free of breast cancer, living with breast cancer, dead of breast cancer, or dead of other cause) at the time of the last follow-up at Songklanagarind Hospital, were collected. The BMI was calculated and then categorized into 4 groups by WHO classification (BMI <18.5, BMI 18.5-24.9, BMI 25-29.9 and BMI >30). Additional data, including age at diagnosis, stage at diagnosis, estrogen receptor (ER) status, progesterone receptor (PR) status, pathological cell type, tumor size, tumor grading, lymph node status, metastatic site and treatment information were also collected. The statistical analysis used were Strata 8.1 to create Cox proportional hazards models to estimate hazard rate (HR) ratios and 95% confidence intervals (CIs) for breast cancer death and recurrence.

**Results:** Total of 1,153 breast cancer patients, age 24 -94 years ( $48.7 \pm 11.4$ ) were enrolled. The median time of follow-up was 43 months after diagnosis. Two hundred

ninety three patients died from breast cancer. There was no statistically significant difference in overall and disease-free survival between obese and non-obese patients. In overall survival, compared with patients in the normal range category of BMI (18.5-24.9), the overweight (BMI 25-29.9) and obese (BMI >30) patients had hazard rate ratio of 1.11 (95% CI, 0.85-1.44) and 1.00 (95% CI, 0.68-1.47), respectively. In disease-free survival, compared with patients in the normal range category of BMI (18.5-24.9), the overweight (BMI 25-29.9) and obese (BMI > 30) patients had hazard rate ratio of 0.89 (95% CI, 0.69-1.13) and 0.81 (95% CI, 0.57-1.15), respectively.

**Conclusion:** Obesity is not a significant prognostic indicator for the survival of breast cancer patient at Songklanagarind hospital.

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### Correlation between Breast Tumor Size in Patients with T1A and T1B Tumors and Axillary Lymph Node Involvement

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*Arisada Wongyai, MD, Areewan Somwangprasert, MD*

Department of Surgery, Faculty of Medicine, Chiang Mai University, Chiang Mai

**Main Outcome Measure:** Tumor size and biological grade, estrogen and progesterone receptor status, number of nodes harvested, and number of nodes positive for disease.

**Objective:** Axillary lymph node dissection (ALND) is important for prognosis but does carry certain morbidities, particularly arm lymphoedema. The incidence of nodal positivity in patients with early breast cancer is low. Our aim was to determine whether tumor size correlates with level of axillary lymph node involvement in order to minimize ALND for small tumors.

**Methods:** Data were collected for retrospective study. These included all patients with T1a, T1b and T1c breast cancer who had both primary breast surgery and axillary lymph node dissection at Maharaj Hospital, Chiangmai, from January 1, 1998 through December 31, 2003.

**Results:** Of 60 patients studied, 2 (3.3%) had T1a, 9 (15%) had T1b and 49 (81.7%) had T1c tumors. Node positivity was 0% for T1a, 11.1% for T1b and 34.7% for T1c tumors. Lymph node involvement and estrogen receptor status were not related.

**Conclusions:** T1a tumors have minimal risk of nodal positivity and may not require subsequent axillary lymph node dissection in the future. T1b and T1c tumors should be managed with routine analysis of axillary node status. Whether sentinel node mapping can change this approach awaits further study.

### The Effect of Restaging Breast Cancer Patients from AJCC 2003 in Songklanagarind Hospital

*Passakorn Pasukdee, MD, Puttisak Puttawibul, MD*

Department of Surgery, Faculty of Medicine, Prince of Songkhla University, Hat-yai, Songkhla

**Background:** The new staging for breast cancer of the American Joint Committee on Cancer Staging for Breast Cancer 2003 (AJCC 2003) may have effects on the changes in the staging of disease, treatments, recurrence of illness, and survival rate of patients with breast cancer, because the new staging system pays attention to the number of nodal metastases.

**Objective:** To compare the staging of the disease and

survival rates between the classification of AJCC 1998 and of AJCC 2003 in the same group of breast cancer patients.

**Methods:** Data were collected retrospectively from the medical record of patients with breast cancer who were treated according to the protocol of Songklanagarind Hospital from January 1994 to December 1998. The AJCC 1988 and AJCC 2003 were then applied postoperative staging of cancer for further comparison.

**Results:** The 961 medical records of breast cancer were studied. Only 494 patients had complete data for comparison of the staging of the disease by the two systems. The average age of the patients was 47.96 years (ranging from 23-94 years).

## BURN, TRAUMA & WOUND HEALING

### Correlation of Clinical Outcome of Integra™ Application with Microbiologic and Pathological Biopsies

*Pornprom Muangman, MD<sup>1</sup>, Heike Deubner, MD<sup>2</sup>, David M Heimbach, MD<sup>3</sup>, Lorenz H Engrav<sup>3</sup>, Nicole S Gibran, MD<sup>3</sup>*

<sup>1</sup>Department of Surgery, Siriraj Hospital, Mahidol University, Bangkok.

<sup>2</sup>Departments of Pathology and <sup>3</sup>Surgery, University of Washington, Seattle, Washington, USA

**Introduction:** Integra™, a dermal regeneration template consisting of bovine collagen and chondroitin-6-sulphate has gained widespread use as a postexcisional treatment for deep burns where sufficient autograft is limited. This study correlates Integra histology and quantitative microbiology cultures with clinical outcomes after autografting.

**Methods:** 29 burn patients who underwent Integra treatment and neodermis biopsy at the time of autografting were reviewed. Biopsies, representative of the best appearing Integra neodermis were sent for histologic examination and quantitative culture. Cultures >105 colony counts were interpreted as wound infection. We analyzed the relationship between wound infection, inflammatory reaction and % autograft take.

**Results:** Average burn size and age were 43% TBSA and 39 years old, respectively. In quantitative neodermis cultures, 90% of samples had bacterial growth; 9 samples (31%) had >105 colony forming units (CFU)/gram. Most common organism was *S. aureus* (31%). Patients with bacterial growth >105 CFU/gram received targeted systemic antibiotics. Integra take (83%) and autograft take (92%) were acceptable even in patients with high bacterial counts

(78% Integra™ take; 86% autograft take). Higher than 50% of biopsies had dermal regeneration similar to normal dermis; foreign body reactions were unusual. Histological evidence of inflammation, especially polymorphonuclear cells, was increased in biopsies with high bacterial counts.

**Conclusions:** Integra and autograft take can be acceptable even with high bacterial counts if wounds are treated with appropriate targeted topical and systemic antibiotics in the presence of microbial contamination. Neodermis biopsies showed fibrous in-growth congruent with existing Integra fibers with minimal foreign body reaction. These data support Integra use as a safe and effective treatment modality in patients with major burns.

### Integra Use in Reconstruction of Complex Wounds

*Pornprom Muangman, MD<sup>1</sup>, Matthew B. Klein, MD<sup>2</sup>, Lorenz H. Engrav, MD<sup>2</sup>, David M. Heimbach, MD<sup>2</sup>, Harunari Nobuyuki, MD<sup>2</sup>, Shari Honari, MD<sup>2</sup>, Nicole S. Gibran, MD<sup>2</sup>*

<sup>1</sup>Department of Surgery, Siriraj Hospital, Mahidol University, Bangkok, Thailand, <sup>2</sup>Department of Surgery, University of Washington, Seattle, Washington, USA

**Background:** The benefits of Integra Dermal Regeneration Template® in the management of extensive burns have been well established. Integra can reduce both donor and graft site morbidity and scarring, and Integra has been reported to be capable of vascularizing over small areas of exposed bone and tendon. Given these potential advantages, we have attempted to use Integra for a variety of other reconstructive applications.

**Methods:** We performed a retrospective review of all patients with complex wounds treated with Integra between 1999-2004. Patient charts were reviewed with attention to wound etiology and location, percent Integra and skin graft take, functional and cosmetic outcome and complications.

**Results:** Integra was used in the management of complex wounds in 10 patients. Indications included necrotizing fasciitis, traumatic extremity degloving injury, meningococemia with purpura fulminans, Marjolin's ulcer, post-burn lip reconstruction, and fourth degree burns with exposed bone (calvarium) and tendon (Achilles). Meshed (1:1) Integra was used in all cases. The mean period from Integra application to autografting was  $19 \pm 6$  days. The take rate of Integra and autograft was  $98 \pm 4\%$  and  $97 \pm 4\%$ , respectively.

**Conclusions:** The benefits of Integra in the management of acute burn wounds can be extended to other types of complex wounds. Integra is particularly useful for coverage of small areas of exposed bone and tendon.

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### Antioxidants Inhibit Neutral Endopeptidase Gene Expression in Human Microvascular Endothelial Cells

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*Pornprom Muangman, MD<sup>1</sup>, Richard Tamura, MD<sup>2</sup>, Nicole S. Gibran, MD<sup>2</sup>*

<sup>1</sup>Department of Surgery, Siriraj Hospital, Mahidol University, Bangkok, Thailand, <sup>2</sup>Department of Surgery, University of Washington, Seattle, Washington, USA

**Background:** Neutral endopeptidase (NEP) is a membrane-bound metalloproteinase that degrades tachykinins and may regulate their role in wound repair. NEP enzyme activity is increased in diabetic wounds and skin compared with normal controls. We have shown that unsaturated fatty acids and glucose upregulate NEP activity in human microvascular endothelial cells (HMECs) and that vitamins E and C reduce this effect.

**Study design:** To determine whether these changes involve NEP gene expression regulation, we analyzed NEPmRNA levels in HMECs cultured with elevated glucose (40mM) and fatty acids oleate (40uM) and linoleate (40uM) for 48 hours or 1 month. Cells were exposed for an additional 48 hours to antioxidants vitamins E or C or N-acetylcysteine. Total RNA was extracted and analyzed for NEPmRNA using real-time reverse transcriptase polymerase chain reaction. NEP gene expression was standardized to beta-actin mRNA and results were analyzed using ANOVA.

**Results:** Elevated glucose, oleate and linoleate upregulated NEPmRNA in short and long term HMEC

Cultures but did not alter rate of NEPmRNA degradation. Vitamins E and C and N-acetylcysteine blocked glucose- and fatty acid-induced NEPmRNA ( $p < 0.05$ ). The potential role of oxidative stress in NEP activation was confirmed by demonstrating that elevated glucose and fatty acids increase  $H_2O_2$  levels in HMECs.

**Conclusions:** Regulation of NEP enzyme activity by glucose and fatty acids appears to include gene expression transcription as well as modulation of enzyme activity. Our results also suggest that oxidative stress may be involved in upregulation of NEP by fatty acids and glucose.

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### Developing A National Trauma Registry: The Australian and New Zealand Experience

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*Cliff W Pollard, MD, TM Davey, MD*

National Trauma Registry Consortium (Australia and New Zealand) Steering Committee

**Purpose:** To describe the development of a National Trauma Registry in Australia and New Zealand and results from the first report.

**Methods:** A Consortium was established to develop a National Trauma Registry. The Consortium is based on strong collaborative relationship between the participating trauma registries and the Consortium leaders. Participating registries currently include all registries (both hospital-based and Central/state/provincial registries) operating in Australia and New Zealand. The first report produced by the Consortium was based on data collected by all registries in 2002. All patients within that year who met individual trauma registry inclusion criteria and who had an Injury Severity Score of greater than 15 were included. Data collected for the report were based on a set of de-identified data elements which included injured patients' demographics, as well as the causes and outcomes of injury. Due to ethical considerations dates were supplied in aggregate form only.

**Results:** A total of 5,438 patients were included in the report. Fifteen percent (830) of patients did not survive to hospital discharge ( $n = 5,434$ ). Males represented 75% (4,031) of all injured patients ( $n = 5,401$ ). However survival rates for males and females were approximately equal. Road traffic accidents and falls accounted for the greatest number of injuries. On average length of hospital stay was 16 days and over half of patients required admission to an intensive care unit.

**Conclusions:** The successful formation and maintenance of a National Trauma Registry Consortium provides the basis upon which to develop a National Trauma Registry (Australia and New Zealand). The production of the first



report demonstrates the commitment of the relevant stakeholders to improving patient outcomes by providing quality trauma data to aid in the monitoring, managing and future planning of the Australian and New Zealand trauma care systems.

### The Insufficiency of Parkland Formula for Burn Patient Resuscitation

Pongsit Chunpongtong, MD, Apichai Angspatt, MD

Division of Plastic and Reconstructive Surgery, Department of Surgery, Faculty of Medicine, Chulalongkorn University, Bangkok

**Introduction:** In 1968, Dr. Charles Bexter proposed the Parkland formula to estimate fluid resuscitation in burn patient and it had been popular since. Recently there has been a question of its effectiveness.

**Objectives:** The purpose of this study was to compare between estimated and actual fluid resuscitation volumes using Parkland formula.

**Methods:** The retrospective study of resuscitation in burn patients with TBSA more than 20% at King Chulalongkorn Memorial Hospital was performed. From January 1995 to August 2004, there were 103 burn patients. Patients with inhalation injury, high voltage electrical injury, delayed resuscitation and associated trauma or incomplete data were excluded.

**Results:** Data of consecutive 22 patients (mean age of  $28.66 \pm 8.2$  years, mean weight of  $59 \pm 8.36$  kg, TBSA  $33.42 \pm 12.79\%$ , mean urine output of  $1.3 \pm 0.5$  ml/kg/hr.) were recorded and tested for statistical difference between estimated volume and actual received volumes. The 24-hour resuscitation volume of  $9,665.8 \pm 4,391.9$  ml ( $5.05 \pm 1.72$  ml/kg/% TBSA) was significantly greater than predicted ( $P < 0.045$ ) and exceeded estimated volumes in 15 (68%) patients.

**Conclusion:** This can be concluded that the received fluid resuscitation volumes in burn patients are greater than the predicted volumes by Parkland formula.

### The Time-related Changes of Microbial Colonization and Pattern of Antimicrobial Drug Sensitivity in Burn Patients

Tanayos Suyabodha, MD, Apichai Angspatt, MD

Division of Plastic and Reconstructive Surgery, Department of Surgery, King Chulalongkorn Memorial Hospital, Bangkok

**Objectives:** To verify the pattern of microbial colonization and drug sensitivity

**Methods:** A retrospective study was performed on 24 burn patients admitted in the burn unit and intensive care unit at King Chulalongkorn Memorial Hospital. From June 1, 2003 to February 1, 2005, there were 160 sampling collected (swab culture, tissue biopsy). Two hundred and twenty six microbial were isolated and 12 different species of bacteria including yeast were detected.

**Results:** Our results showed that in the first 7 days gram positive organism predominated (67%) then gradually declined (48% in 2nd week, 30% in the 3rd and 4th week) similar to other reports, but the gram positive organism was found increasingly again (50%) in the next 30 days with MRSA predominated (38%). Fungus was scattered, mostly after 2nd week except for one child that was found on admission. All of MRSA were not resistant to vancomycin and teicoplanin. Gram negative organisms that predominated after the 2nd weeks were *Acinetobacter baumannii*, *E. coli*, *P. aeruginosa* (37%, 27%, 13% of all gram negative organism) respectively. Most of the *Acinetobacter* resisted to cefarospirin, ciprofloxacin and piperacillin. All *P. aeruginosa* resisted to sulfoperazone and all *E. coli* resisted to ciprofloxacin.

## ENDOCRINE

### Lesson Learned From 24 Consecutive Cases of Insulinoma at Siriraj Hospital: Preoperative Localization May Not be Needed

Thanyadej Nimmanwudipong, MD,

Vitoon Chinsawangwatanakul, MD,

Narong Lert-akayamane, MD, Kijja Sindhavananda, MD

Department of Surgery, Siriraj Hospital, Bangkok Noi, Bangkok

**Introduction:** Successful treatment of insulinoma is dramatic for patients and breathtaking for physicians.

Preoperative localization is always desirable for the surgeon but turns out to be confusing in many cases.

**Material and Method:** We described our experiences of 24 consecutive cases of insulinoma, 18 females and 6 males.

**Results:** The nature of tumors included 20 solitary adenoma, 2 malignant insulinoma with metastasis and 2 diffused microadenoma and hyperplasia. Tumor distribution in the pancreas was as follows: head 5, uncinate 2, neck 3, body 6 and tail 8. Early in this series, preoperative

localization yield was disappointing. Correct localization was 0%, 11%, 33% for extracorporeal U/S, CT and angiogram respectively. The more recent use of MRI yielded 71% correct localization. Out of 24 cases, 11 were correctly located preoperatively and 11 were not. Every single preoperatively located tumor was easily found at the time of surgery. Intraoperative palpation only identified the tumor in 80% (19 of 24 cases). Combined with intraoperative US, 92% of all tumor were found (22 of 24 cases), an addition of 12% to palpation alone. The two unidentified lesions were microadenoma and hyperplasia not located by any technique. In certain patients whose one localization modality was negative or equivocal, an addition of complimentary second imaging modality was usually contradictory.

**Conclusion:** Considering the high intraoperative success and low preoperative yield, preoperative localization may not be needed once biochemical diagnosis is established.

#### Increase of Expression of Receptors Steroid Hormones in Patients with a Rectal Cancer, Prostate Cancer, Bladder Cancer and PADAM

*Alexander V. Pechersky<sup>1</sup>, Vladimir F. Semiglazov<sup>2</sup>, Boris K. Komyakov<sup>3</sup>, Bakhman G. Guliev<sup>4</sup>, Andrey I. Gorelov<sup>5</sup>, Andrey I. Novikov<sup>3</sup>, Viktor I. Pechersky<sup>6</sup>, Nikolay N. Simonov<sup>2</sup>, Alexey V. Gulyaev<sup>2</sup>, Igor A. Samusenko<sup>3</sup>, Maxim S. Vonsky<sup>7</sup>, Alexey G. Mittenberg<sup>7</sup>, Oleg B. Loran<sup>8</sup>*

<sup>1</sup>St. Petersburg Medical Academy of Post-Graduate Studies, St. Petersburg, Russia, <sup>2</sup>N.N. Petrov Scientific-Research Institute of Oncology, St. Petersburg, Russia, <sup>3</sup>St. Petersburg State Medical Academy of I.I. Mechnikov, St. Petersburg, Russia, <sup>4</sup>Municipal Multi-Profile Hospital No 2, St. Petersburg, Russia, <sup>5</sup>St. Petersburg State University, St. Petersburg, Russia, <sup>6</sup>P.F. Lestgaft State Academy of Physical Education, St. Petersburg, Russia, <sup>7</sup>Institute of Cytology of the Russian Academy of Sciences, St. Petersburg, Russia, <sup>8</sup>Russian Medical Academy of Post-Graduate Studies, Moscow, Russia

**Introduction:** Partial androgen deficiency of aging men (PADAM) disrupts the normal development cycle of cells with androgen receptors.

**Methods:** In the current study, 15 patients were held under observation (5 with prostate cancer, 5 with bladder cancer and 5 with rectal cancer).

**Results:** The levels of testosterone in the tissues of the peritumorous zone of the prostate as well as in the tumorous tissue in patients with cancer of the prostate, bladder, and rectum were higher than analogous indices in the blood serum. The indices of the histochemical score of AR in the peritumorous zone among patients with prostate

cancer were higher than the analogous indices of the control group. Upon research of the peritumorous zone among patients in the observed groups, expressions of ER, PR, bcl-2, Ki67 and p53 were detected.

**Conclusions:** The results of this study suggest the conclusion that production of testosterone by a whole set of tumors and tissues of the peritumorous zone, which is accompanied by increased proliferative activity and disturbance of the regulation of the cell cycle, is caused by PADAM. The given changes are directed at compensating for testicular deficiency.

#### The Effects of Changes in Testosterone Level on the Levels Cell Growth Factors

*Alexander V. Pechersky<sup>1</sup>, Vladimir F. Semiglazov<sup>2</sup>, Oleg B. Loran<sup>3</sup>, Vadim I. Mazurov<sup>1</sup>, Anatoly I. Karpischenko<sup>4</sup>, Aleksy M. Nikiforov<sup>5</sup>, Natalya M. Kalinina<sup>5</sup>, Larissa B. Drygina<sup>5</sup>, Natalya I. Davydova<sup>1</sup>, Marina G. Skorobogatikh<sup>5</sup>*

<sup>1</sup>St. Petersburg Medical Academy of Post-Graduate Studies, St. Petersburg, Russia, <sup>2</sup>Petrov Research Institute of Oncology, St. Petersburg, Russia, <sup>3</sup>Russian Medical Academy of Post-Graduate Studies, Moscow, Russia, <sup>4</sup>Russian Military Medical Academy, St. Petersburg, Russia, <sup>5</sup>All-Russian Center of Emergency and Radiation Medicine, EMERCOM of Russia, St. Petersburg, Russia

**Introduction:** The capacity of a colo-rectal cancer and prostate cancer depends on the levels of on cell growth factors.

**Methods:** 14 patients with stage 3-4 cancer of the prostate were held under examination.

**Results:** A month after orchiectomy, the reduction of testosterone in all patients was accompanied by a statistically meaningful increase of prolactin, STH, and estrone (p < 0.05). The reduction of 5 $\alpha$ -dihydrotestosterone determined the reduction of EGF (p < 0.05). The decrease in the level of testosterone was accompanied by a statistically significant increase in the levels of insulin, IGF-1 (p < 0.05), bFGF (p < 0.01), 25-OHVitD3, and Ca<sup>++</sup> (p < 0.05) as well as by a reduction in the levels of  $\beta$ TGF, IL-1 $\beta$ , TNF $\alpha$  (p < 0.05), acid phosphatase (p < 0.01), alkaline phosphatase (p < 0.05) and PSA (p < 0.005).

**Conclusions:** The increase in aromatase activity and the levels of the majority of growth factors after orchiectomy indicate that compensatory-adaptation reactions which develop when the level of testosterone goes down are directed towards an increase in the activity of the cells. Their expression is proportional to the degree of reduction of the testosterone level. The reduction of the testosterone level causes the breach of regulation of the cell-cycle and the start of apoptosis. It is the model of PADAM.

### The Effect of Testosterone Level on the Activity of Aromatase and 5 $\alpha$ -reductase in Experiment

Alexander V. Pechersky<sup>1</sup>, Vadim I. Mazurov<sup>1</sup>,  
Vladimir F. Semiglazov<sup>2</sup>, Anatoly I. Karpischenko<sup>3</sup>,  
Andrey V. Udintsev<sup>3</sup>

<sup>1</sup>St. Petersburg Medical Academy of Post-Graduate Studies, St. Petersburg, Russia, <sup>2</sup>Petrov Research Institute of Oncology, St. Petersburg, Russia, <sup>3</sup>Russian Military Medical Academy, St. Petersburg, Russia

**Introduction:** The capacity of a colo-rectal cancer and benign prostate hyperplasia depends on the levels of 5 $\alpha$ -dihydrotestosterone and 17 $\beta$ -oestradiol presence.

**Methods:** Experimental work was conducted on testosterone-sensitive cell lines of foreskin fibroblasts of three parallel trials. In the work of the experiment, a qualitatively cross-sown culture of cells was incubated for

two hours on a three-time duplicated incubation medium containing testosterone in various concentrations.

**Results:** According to the results, the accumulation of biologically active metabolites of testosterone was minimal before incubation of the cells with a concentration of testosterone of 7.0 ng/mL (24.3 nmol/L), which is the physiological level of testosterone content.

**Conclusions:** Any replacement of the content of the testosterone in the medium (as an increase or decrease from physiological level) leads to a consistent growth in the formation of 5 $\alpha$ -dihydrotestosterone and 17 $\beta$ -oestradiol. The results of the research suggested that the most important factor in the reduction of the development of 5 $\alpha$ -dihydrotestosterone and 17 $\beta$ -oestradiol in patients with partial androgen deficiency was the restoration of the physiological level of testosterone.

## HEAD & NECK

### Surgical Treatment of Severe Hypoplasia of the Trachea and Bronchi: A Case Report

Teeravit Phanchaietch, MD

Department of Surgery, Siriraj Hospital, Bangkok-Noi, Bangkok

**Background:** Hypoplasia of the trachea and bronchi is a rare disorder. Severe respiratory distress is often apparent early in the neonatal period. Various reconstruction techniques and material for repair that have been developed included pericardial patch, costal cartilage, slide tracheoplasty and free tracheal autograft technique.

**Objective:** To report surgical technique for correction of an infant with hypoplasia of the trachea and double right main bronchial stenosis using slide tracheoplasty and slide bronchoplasty with free bronchial autograft repair of the residual mid tracheal stenosis.

**Materials and Methods:** An 8 month-old boy with a history of recurrent respiratory failure needed high

frequency oscillating ventilator support for severe hypercarbia. HRCT scan demonstrated stenosis of entire length of the trachea and double right main bronchial stenosis with the internal lumen of 2.0-2.5 mm in diameter. Emergency sliding tracheoplasty was performed with cardiopulmonary bypass support. The patient needed ventilator support for 6 weeks postoperatively. He still had a significant stenosis of the right bronchi and a short segment stenosis of the mid trachea and required second operation 15 months later. The right thoracotomy was performed. A short segment of the lower right main bronchus was used to enlarge the mid trachea and slide bronchoplasty was done to the main bronchi. The patient recovered well from the operation. Postoperative bronchoscopy revealed only mild stenosis of the trachea.

**Conclusion:** Complex congenital tracheal stenosis can be successfully managed by combined several surgical techniques.

## HEPATO-BILIARY-PANCREATIC SURGERY

### A Case of Hemosuccus Pancreaticus

Hideaki Hashida, MD, Masanori Ohara, MD,  
Kazuteru Komuro, MD, Nozomu Iwashiro, MD,  
Masanori Ishizaka, MD

National Hakodate Hospital, Hakodate-city, Hokkaido, Japan

A 70 years-old-male, who received distal gastrectomy

(Billroth II anastomosis) and cholecystectomy in 1952, was admitted on April 4, 2003 because of hematemesis. He had severe anemia (hemoglobin level was 6.0 g/dl) and the abdominal CT with contrast medium pointed out 6 cm-sized mass including high density region, and the splenic artery aneurysm was diagnosed. However, the upper gastrointestinal endoscopy and colonoscopy could not

reveal the bleeding point, and he was discharged on April 14. He had melena after discharge and was admitted again on October 6. But upper gastrointestinal endoscopy, colonoscopy, photoscintigraphy of hemorrhage and angiography could not reveal the bleeding point.

We performed the laparotomy on October 30, but the bleeding point could not be observed in the afferent loop of Billroth II anastomosis even by the endoscopy in the operation. Due to repeated melena, we diagnosed hemosuccus pancreaticus by splenic artery aneurysm penetrating into pancreas finally, and performed distal pancreaticosplenectomy on November 26. The X-ray with injection of the contrast medium from main pancreatic duct of the resected specimen revealed the connection between the main pancreatic duct and the splenic artery.

Histopathological examination revealed the pseudo-aneurysm due to the lack of the elastic fiber in the wall of the aneurysm and the connection between the pseudo-aneurysm and the main pancreatic duct. Postoperative course was uneventful, and he does not have hematemesis and melena up to present. A case of hemosuccus pancreaticus is presented with a review of literature.

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### A New Technique for Hepatectomy: Laparoscopic Hepatectomy by Curettage and Aspiration

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*Xiujun Cai, Shuyong Peng, Hong Yu, Xiao Liang, Yifan Wang, Lizhong Lin, Yuhua Zhang, Jida Cheng, Xianfa Wang, Libo Li*

Sir Run Run Shaw Hospital, College of Medicine, Zhejiang University Hangzhou, Zhejiang, China

**Introduction:** To improve the technique and the instruments for hepatectomy, our institution began to explore a new technique for hepatectomy in 1996 and had created a less-invasive, safe and effective technique: laparoscopic hepatectomy by curettage and aspiration. We also designed a special instrument (Laparoscopic Peng's multifunction operative dissector, LPMOD) for this procedure.

**Methods:** From 1996 to March 2005, we performed this procedure on 53 patients, 30 males and 23 females, mean age was 45.2 years (range from 26-69). Of all the patients, 23 had left lateral hepatectomy, 29 had partial hepatectomy, and 1 had right hepatectomy.

**Results:** The operation was completed totally and laparoscopically in 51 patients (including the laparoscopic right hepatectomy), 2 patients were converted to an open hepatectomy, one for unmanageable raw surface cirrhosis and the other for severe adherence of abdominal cavity. The mean operating time was 146 min and the mean

operative blood loss was 460 ml. Complications occurred in two patients undergoing left lateral hepatectomy. One was bile leakage and the other was pneumothorax. All patients could walk in 24 hours after operation. The average length of hospital stay was one week.

**Conclusions:** Laparoscopic hepatectomy by curettage and aspiration is a less-invasive, safe and effective technique for hepatectomy and should be widely adopted. Laparoscopic Peng's multifunction operative dissector (PMOD) has the function of crash, inactive cut, aspiration, electric coagulation and could complete these manipulations at the same time. It is an ideal equipment for laparoscopic hepatectomy.

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### Recurrent Pyogenic Cholangitis - Evolution of Surgical Management

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*Melanie DW Seah, Pierce KH Chow, Sujit S Gill, LY Khin, Alexander YF Chung, London L Ooi, WK Wong*

Singapore General Hospital, Singapore

**Materials and Methods:** The surgical management of recurrent pyogenic cholangitis (RPC) has evolved over time. We review here our experience with this condition. Medical records of patients from January 1987 to August 2004 were extracted. The demographics, presentation, investigations and radiological imaging performed were reviewed, surgical procedures and their outcomes analyzed in detail.

**Results:** A total of 48 patients with a mean age of 56 years and mean follow-up period of 41 months, were reviewed. Most patients presented with abdominal pain (39 patients), fever (34 patients) and jaundice (12 patients). Ultrasonography remains useful as a first line investigation (40 patients). More recently, MRCP has provided thorough delineation of the biliary tree as well as demonstrated the presence of cholangiocarcinomas. Definitive surgery involved a bilioenteric bypass in 37 patients, creation of a subcutaneous jejunal pouch in 20 patients and liver resection in 27 patients.

**Conclusions:** MRCP has overtaken diagnostic ERCP and will likely overshadow the utility of CT imaging. As a result, an early correct diagnosis of RPC has become more common and increasingly, patients undergo definitive surgical procedures from the onset. This is reflected in the decreasing number of initial cholecystectomies performed in the recent years. Where hepatic resection is performed, we find that a left lateral segmentectomy is sufficient in most cases. A hepaticojejunostomy with a subcutaneous jejunal pouch is now the bilioenteric bypass of choice as it facilitates passage of residual or recurrent intrahepatic



stones while providing a non-operative route for stone clearance via the subcutaneous jejunal limb.

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### Biliary Tract Stone Proximal to a Bilio-digestive Anastomosis

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*Jimmy Panelewen, MD, Benny Philippi, MD*

Cipto Mangunkusumo Hospital, Jakarta, Indonesia

**Background:** Stone formation above a bilio-digestive anastomosis is related to multiple factors. Stenosis is the main cause of biliary stasis. This is often a cause of infection.

**Methods:** We report two cases of obstructive jaundice with history of bilio-digestive anastomosis. The imaging results showed that there was a stone at proximal bilio-digestive anastomosis.

**Results:** We performed laparotomy and found stricture and stenosis at the anastomosis and a biliary tract stone above it. We removed the stone then made a new anastomosis after intraoperative cholangiography.

**Conclusions:** It is common for the bilio-digestive anastomosis to be followed with recurrent biliary stone. Therefore method of operation will be done to reduce risk such as to minimize injury of the vessel. Intraoperative cholangiography will be conducted to make sure there is no stone left in the intra and extrahepatic tract.

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### Emergency versus Delayed Hepatectomy for Ruptured Hepatocellular Carcinoma: A Personal Experience

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*Anon Chotirosniramit, MD*

Department of Surgery, Faculty of Medicine, Chiang Mai University, Chiang Mai

**Background:** Ruptured hepatocellular carcinoma (HCC) is a life-threatening complication of HCC. Emergency hepatectomy or delayed hepatectomy after successful hemostasis is the controversial issue of the treatment for respectable, ruptured HCC.

**Objective:** The aim of this study was to evaluate outcomes of emergency and delayed hepatectomy for ruptured HCC.

**Materials and Methods:** From 2001 to 2004, 50 patients underwent hepatectomy for HCC by the author. Of these, 16 patients had ruptured HCC. Emergency hepatectomy was performed in 10 patients and delayed hepatectomy in the remaining 6. Clinical data of all resectable HCC patients were reviewed and analyzed retrospectively. Operative outcomes were compared between the group receiving emergency hepatectomy for ruptured HCC and those receiving delayed hepatectomy for ruptured HCC or

elective hepatectomy for non-ruptured HCC.

**Results:** In the emergency hepatectomy group, 5 of them had shock pre-operatively. Complications included one transient gastric atony and one post-operative death from massive variceal bleeding. Six of 10 patients survived with a 1-year survival rate of 50%. No recurrent disease was detected in 3 of them. No post-operative complications and death were found in delayed hepatectomy patients but two patients died in 11 months and one died in 8 months due to lung metastasis. No statistically significant difference in morbidity and mortality rate was found between the emergency hepatectomy group and delayed or elective hepatectomy group.

**Conclusion:** Emergency hepatectomy may be a life-saving procedure following ruptured HCC, with an acceptable mortality rate. In resectable ruptured HCC, hepatectomy should be performed as soon as possible.

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### Pancreaticojejunostomy for the Narrow Pancreatic Duct

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*Kenichi Hakamada, MD, Norihisa Kimura, MD,*

*Yutaka Umehara, MD, Yoshikazu Toyoki, MD,*

*Mutsuo Sasaki, MD*

Department of Surgery, Hirosaki University, Hirosaki, Japan

**Background and Aims:** Pancreaticojejunostomy for narrow pancreatic duct is one of the major technical hurdles to complete pancreaticoduodenectomy. We developed a simple, easy technique, by using a fast absorbable suture.

**Methods:** Briefly, 5 or 6 Fr stent tube with a notch near the tip was inserted into and fixed to the duct by a 4-0 fast-absorbable suture. Then, seromuscular layer of the jejunal limb was cut and the jejunal submucosa was exposed at the same width as the pancreatic cut surface. At the center of the submucosa, a purse string suture was performed by a 4-0 fast-absorbable string. Another tip of the stent tube was inserted into the intestinal lumen at the center of the purse string suture, where the stent tube was ligated and fixed. Then, both sutures fixed to the pancreatic duct and the jejunal submucosa were approximated to contact each other and ligated. Then, rough interrupted sutures between pancreatic parenchyma and jejunal seromuscular layer were added. On POD 14, the stent tube was pulled out under confirmation of no leakage by the tube pancreatography.

**Results:** The average time to perform this technique was about 12 min. which was significantly shorter than 30 min of the conventional duct-to-duct anastomosis. There were no significant differences in occurrence of anastomotic leakage and hospital stay.

**Conclusions:** This new technique allows even junior surgeons to perform pancreaticojejunostomy of the narrow pancreatic duct safely.

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### Laparoscopic Duodenopancreatectomy with Binding Pancreaticojejunostomy (without using Stapler)

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*Defei Hong, MD, Shuyou PENG, MD, Xue-yong Zhen, MD*

Department of General Surgery, Sir Run Run Shaw Hospital, Zhejiang University, Huangzhou 310016, China

**Background:** In the past few years, minimally invasive therapy for pancreatic diseases has made significant strides but the role of laparoscopic pancreaticoduodenectomy is still controversial. Otherwise a leak or fistula from the pancreatic anastomosis is the leading cause of morbidity and mortality after pancreaticoduodenectomy.

**Methods:** A 44 year-old female with duodenal papillary adenocarcinoma diagnosed by ERCP was chosen for a laparoscopic pancreaticoduodenectomy, and a new technique-binding pancreaticojejunostomy was undertaken to prevent pancreatic anastomosis leakage.

**Results:** The procedure was laparoscopically completed with an operating time, blood loss, and hospital stay of 660 min, 400ml, and 14 days, respectively. There was no complications attributable to this surgery. The patient could walk and the NG tube was removed by the third postoperative day. Enteral nutrition was started with jejunostomy by the third postoperative day. Oral intake was started 5 days after surgery.

**Conclusions:** It can be inferred from this experience that laparoscopic pancreaticoduodenectomy can be considered for the treatment of tumors of periampullary region. Binding pancreaticojejunostomy is also undertaken by laparoscopy to prevent pancreatic anastomosis leakage.

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### The Effects of Octreotide on Hepatic Regeneration after Partial Hepatectomy

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*Ali Uzunkoy, MD<sup>1</sup>, Ilyas Ozardali, MD<sup>2</sup>*

<sup>1</sup>Departments of General Surgery and <sup>2</sup>Pathology, Harran University School of Medicine, Sanliurfa, Turkey

This study was planned to investigate the effects of octreotide on hepatic regeneration after partial hepatectomy. Sixty rats were divided into 6 groups. Following 2/3 hepatectomy, 0.1 mg octreotide was administered subcutaneously in 1st, 2nd, and 3rd groups twice a day during study. Octreotide was not administered in 4th, 5th, and 6th groups as control. The rats in the 1st and 4th groups were sacrificed after one day. The rats in the 2nd

and, 5th groups were sacrificed after 3 days. The rats in the 3rd and 6th groups were sacrificed after 5 days. The remnants of the liver were resected for histopathologic examination. Venous blood samples were drawn for the study of SGOT and SGPT. The levels of the regeneration of the liver were evaluated by the evaluating of mitotic index, double nucleus and hyperchromatic nucleus. The number of mitotic index decreased significantly in the groups which were administered octreotide. The number of the double nucleus increased significantly in the groups which were administered octreotide. The number of the hyperchromatic nucleus increased significantly in the groups which were administered octreotide and sacrificed first day. The changes of SGOT and SGPT levels were not significantly different between control and octreotide groups.

In conclusion, the octreotide effects adversely liver regeneration after partial hepatectomy.

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### Two-Wound VS Four-Wound Laparoscopic Cholecystectomy

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*Thiti Sawaengtham, MD*

Department of Surgery, Nakhonpathom Regional Hospital, Nakhonpathom, Thailand

**Background:** Laparoscopic cholecystectomy is now standard treatment of gallstone disease. For now 3- or 4-wound techniques is usually applied. Many of the studies reported using 2-wound technique but most of them required special instruments. The aim of this study is to compare the 2-wound and 4-wound technique by using standard instruments.

**Methods:** From 2003 to 2005, 40 patients undergoing elective laparoscopic cholecystectomy for gallstone disease by one surgeon were divided into 2 groups to receive the 2-wound or 4-wound technique. Analgesia requirements, length of operation and postoperative stay were recorded. For 2-wound group, a 5 mm port was used for 5 mm, 0 degree lens in subumbilical wound. A 3 mm port was used for grasping gallbladder in the same wound with lens port and the last 5 mm port was used for dissecting and clips at epigastrium just lateral to the falciform ligament.

**Results:** Demographic data were comparable for both groups. There was no difference between 2 groups in the length of operation, postoperative stay and success rate. The 2-wound group required fewer analgesic injections (81 vs 123,  $p = 0.01$ ).

**Conclusions:** The 2-wound laparoscopic cholecystectomy resulted in less surgical scars, good cosmetic and less pain. The 2-wound laparoscopic cholecystectomy can

be used as standard procedure with the use of standard instruments.

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### A Case of Exophytic Spread of Abscess from Hepatolithiasis via Perihepatic Ligaments

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*Yutaka Umehara, Kenichi Hakamada, Norihisa Kimura, Shyunji Narumi, Syuichi Yoshihara, Mutsuo Sasaki*

Department of Surgery, Hirosaki University School of Medicine, Hirosaki, Japan

We report a case of exophytic spread of abscess from hepatolithiasis via perihepatic ligaments. A 60-year-old man reported severe pain, induration and redness of the skin in the median of upper abdomen. He had past history of total gastrectomy, distal pancreatectomy, splenectomy and cholecystectomy to treat perforation of the gastric cancer. Plenty of purulent discharge containing small calculus was observed by incisional drainage. Abdominal CT indicated hyperplasia of connective tissue from the round ligament of the liver to pancreas head via hepatoduodenal ligament. MRCP indicated connection of dilated bile duct to lateral segment of the liver to the abscess cavity.

According to these findings, cholangitis, accompanying hepatolithiasis, spread via round ligament of the liver was diagnosed. Lt. lobectomy of the liver was performed and pin-hole like stenosis was found at the junction of the bile duct to segment 2 and 3 in the specimen. Also, dilated bile duct to segment 3, parallel the round ligament of the liver, connected to abscess cavity. Pathological examination indicated granulation from connective tissue around the liver to corium and subcutaneous tissue. Inflammatory disease involving perihepatic ligaments are rare and this type of spread of inflammation should be kept in mind for early diagnosis and appropriate treatment.

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### Treatment for Iatrogenic Biliary Bleeding and Timing of Treatment for Choledocholithiasis

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*Norihisa Kimura, MD, Kenichi Hakamada, MD, Yutaka Umehara, MD, Shunji Narumi, MD, Mutsuo Sasaki, MD*

Department of Surgery, Hirosaki University School of Medicine, Hirosaki, Japan

Iatrogenic biliary bleeding is a rare complication of percutaneous transhepatic biliary drainage (PTBD) or endoscopic retrograde biliary drainage (ERBD) and the treatment still remains problems. We reported here two cases of treatment for iatrogenic biliary bleeding after PTBD and ERBD.

Case 1 was an 80-year-old female who suffered from biliary bleeding after PTBD and ERBD for acute obstructive suppurative cholangitis due to cholecystocholedocholithiasis. For biliary bleeding that continued for 10 days and progression of acute renal failure, angiography was performed. It indicated bleeding from anterior segmental branch of hepatic artery and hemostasis by arterial coiling was performed. Improvement of renal failure was obtained after the hemostasis. However, the patient died 3 months later due to flare up of renal failure accompanying liver abscess.

Case 2 was a 46-year-old female who suffered from biliary bleeding for 20 days after PTBD for obstructive jaundice due to cholecystocholedocholithiasis. Angiography was performed and indicated bleeding from hepatic artery (A8) and hematoma in the liver. Hemostasis by arterial coiling followed by cholecystectomy, choledocholithotomy and removal of intrabiliary hematoma were performed. The patient was discharged 18 days after surgery without any complications.

**Conclusions:** It was difficult to control arterial biliary bleeding after PTBD and ERBD by only management of drainage tubing, and hemostasis under angiography is thought to be necessary in case of continuous biliary bleeding. Moreover, curative operation for choledocholithiasis should be performed immediately after improvement of general condition to avoid hepatic abscess and/or cholangitis.

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### Successful Treatment of an Endoscopic Papillary Dilatation-induced Pancreatic Pseudocyst with Percutaneous Catheter Drainage

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*Norihisa Kimura, MD, Kenichi Hakamada, MD, Yoshikazu Toyoki, MD, Shunji Narumi, MD, Mutsuo Sasaki, MD*

Department of Surgery, Hirosaki University School of Medicine, Hirosaki, Japan

We report a case of a pancreatic pseudocyst which was successfully treated with percutaneous catheter drainage. A 43-year-old male, who had suffered from acute fulminant pancreatitis after endoscopic papillary dilatation for cholecystocholedocholithiasis, was introduced to our hospital 5 months later for the treatment of a 20 × 8 × 6 cm post-necrotic pancreatic pseudocyst. Because the cyst grew rapidly up to 26 × 14 × 12 cm in size and ERCP visualized the normal pancreatic duct without any connection with the cyst, percutaneous cyst drainage was performed under ultrasonography. The size of the cyst decreased soon, and the discharge reduced to 2-3 ml/day thereafter. The catheter was removed 92 days after the insertion. Three

years later, the pancreas remained without recurrence of pseudocyst. Based on the understanding of the pancreatic ductal anatomy, percutaneous drainage should be involved in the treatment options of pancreatic pseudocyst. Percutaneous drainage is best applied to patients with normal ducts but no cyst-duct communication.

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### **Involvement of C-MET/Hepatocyte Growth Factor (HGF) Pathway in Cholangiocarcinoma Cells Invasion and Its Therapeutic Inhibition with MEK Kinase Inhibitor (U0126) and Small Interfering RNA**

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*Kawin Leelawat, MD<sup>1</sup>, Surang Engprasert, MD<sup>1</sup>, Panadda Tepaksorn, MD<sup>2</sup>, Prasert Sobhon, MD<sup>3</sup>*

<sup>1</sup>Department of Surgery, Rajavithi Hospital, Bangkok, <sup>2</sup>National Institute of Health, Ministry of Public Health, Bangkok, <sup>3</sup>Department of Anatomy, Mahidol University, Bangkok

**Introduction:** Cholangiocarcinoma is one of the most difficult diseases to treat. The 5-year survival rate is only 20-30% after curative surgery. Therefore, the novel therapeutic is urgently required in patients with cholangiocarcinoma. Recently, c-met/hepatocyte growth factor (HGF) pathway has been implicated in the proliferation, invasion and metastasis in many kinds of cancers, and it may be the promising molecular target for cancer therapy. However, the role of c-Met/Hepatocyte growth factor (HGF) pathway in cholangiocarcinoma cells has not been identified.

**Objectives:** This study aims to investigate the involvement of the c-Met/Hepatocyte growth factor (HGF) pathway in the outgrowth of cholangiocarcinoma cell line.

**Research design and Methods:** This study is designed as in vitro experiment. c-Met expression in cholangiocarcinoma cell line (HuCCA1) and paraffin-embedded tumor tissues were identified by using RT-PCR and immunohistochemistry (IHC) techniques. The signal transduction of c-Met after Hepatocyte growth factor stimulation was identified by Western blot. The potential for targeted inhibition of c-Met/Hepatocyte growth factor pathway was tested using small interfering RNA (siRNA) technique, MEK kinase inhibitor (U0126) and PI3 kinase inhibitor (Ly294002). The resultant inhibition of HuCCA1 cells viability was studied using standard proliferation assay and invasion assay.

**Results:** c-Met was strongly expressed in HuCCA1 cells and tumor tissues. Stimulation of c-Met with Hepatocyte growth factor (10 ng / ml) caused activation of MAPK 44/42 pathway and increased cancer cell invasion. Inhibition of MAPK 44/42 pathway by U0126 and down-regulation of c-Met by siRNA resulted in inhibition of HuCCA1 cell invasion ( $16 \pm 3.2\%$  at 24hr).

**Conclusions:** Activation of c-Met/Hepatocyte growth factor (HGF) pathway induces cholangiocarcinoma cell invasion. Inhibition of molecular targets in this pathway may be the promising novel therapy for patients suffering from cholangiocarcinoma.

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### **Major Hepatic Resection for Hilar Cholangiocarcinoma without Preoperative Transhepatic Biliary Drainage (PTBD)**

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*Narong Khuntikeo, MD, Ake Pughkem, MD, Vacharabhongsa Bhudhisawasdi, MD*

Department of Surgery, Faculty of Medicine, Khon Kaen University, Khon Kaen, Thailand

**Introduction:** The role of preoperative transhepatic biliary drainage (PTBD) prior to hepatic resection in the presence of obstructive jaundice remains controversial. We reported obstructive jaundiced patients with hilar cholangiocarcinoma who underwent hepatic resection following noninvasive assessment and without PTBD.

**Research Design:** Retrospective study

**Methodology:** The records of all patients with hilar cholangiocarcinoma and obstructive jaundice who underwent major hepatic resection at Srinagarind Hospital over the 4-year period from May 1, 1999 to May 31, 2003 were reviewed.

**Results:** Thirty consecutive patients with hilar cholangiocarcinoma and obstructive jaundice underwent major hepatic resection without PTBD. Two patients (6.6%) died 5 and 30 days after right hepatic resection and biliary enteric reconstruction. Twenty-three patients (76.67%) experienced postoperative complications, mainly from pulmonary complications and subphrenic collection (34% and 17%). Liver and renal failure were surprisingly low (1.9% both).

**Conclusions:** Major hepatic resections without PTBD are safe in most hilar cholangiocarcinoma patients with obstructive jaundice. Incidence of postoperative complications, especially pleural effusion and intra-abdominal collections are high. Whether PTBD could improve these results remains to be determined.

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### **Prognostic Study of Combined Hepatocellular Carcinoma and Cholangiocarcinoma (HCC-CC) in Thai Population**

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*Songyos Chantajitr, MD, Chumpon Wilasrusmee, MD, Ninattannun Promsopha, MD*

Department of Surgery, Ramathibodi Hospital, Bangkok

**Background:** Combined hepatocellular and cholangiocarcinoma (HCC-CC) is an uncommon subtype of



primary liver cancer, the clinicopathological features of which have rarely been reported in details. Some authors believe that HCC-CC behaves like HCC, but biliary differentiation may be associated with poorer prognosis. Moreover, cholangiocarcinoma has more frequent lymph node metastases. In this study we propose to determine the clinical course and survival outcome of the HCC-CC patients in Thai population by comparing them with the ordinary HCC patients.

**Methods:** The clinicopathological features of patients who were diagnosed as HCC-CC at Ramathibodi Hospital during 1990-2004 were retrospectively studied by comparing them with the features of patients suffering from ordinary hepatocellular carcinoma (HCC). Statistics were calculated using SPSS version 10.0. The Kaplan-Meier method was used to assess survival rate. Multiple logistic regression analysis was performed to assess correlations. A value of  $p < 0.05$  was considered statistically significant.

**Results:** There were 25 HCC-CC patients included in this study. The HCC-CC patients showed greater similarity with HCC patients. No significant difference between HCC and HCC-CC when comparing stage by stage (Child-Pugh, Okuda, CLIP, TNM). Surgical treatment is the best option for HCC-CC.

**Conclusions:** In most cases, HCC-CC seems to be a variant of ordinary HCC with cholangiocellular features, rather than a true intermediate disease entity between HCC and CC. The surgical approach is recommended for selected patients with HCC-CC.

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### Preoperative Portal Vein Embolization before Major Hepatic Resection in Biliary Tumor: A Preliminary Report

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*Ake Pugkhem, MD<sup>1</sup>, Narongchai Wongkonkitsin, MD<sup>1</sup>, Vallop Loapaiboon, MD<sup>1</sup>, Chawalit Pairojkul, MD<sup>2</sup>, Vajarabhongsa Bhudhisawasdi, MD<sup>1</sup>, Thongueb Uttaravichien, MD<sup>1</sup>*

Departments of Surgery<sup>1</sup> and Pathology<sup>2</sup>, Faculty of Medicine, Khon Kaen University, Khon Kaen

**Introduction:** Major hepatic resections in patients with chronic parenchymal or cholestatic liver diseases are associated with significant morbidity and mortality. Preoperative portal vein embolization (PVE) to induce hypertrophy of future liver remnant preoperatively may result in the increase of operative safety.

**Materials and Methods:** The medical records of 8 patients who underwent major hepatectomies after PVE from 2003 to 2004 were retrieved. Demographic data, technique of PVE, total liver volume (TLV), post PVE future liver volume (FLV), morbidity, and mortality were

collected and analyzed.

**Results:** There were 6 intraductal papillary mucinous tumors (IPMT) of the bile duct and 2 hilar cholangiocarcinoma. Left percutaneous transhepatic biliary drainage (PTBD) was performed before PVE in 3 cases. Right PVE was performed by transileocolic route in all. There was migration of embolized substance to contralateral lobe in 1 case. Right hepatectomy with extrahepatic bile duct resection and enterobiliary anastomosis was performed in 7 cases and right hepatectomy in 1 case. Mean FLV/TLV was 52.75% (40.2%-63.2%). There was subphrenic collection in 1 case and was successfully treated by percutaneous drainage. No postoperative liver failure or mortality was encountered.

**Conclusion:** Preoperative PVE before major hepatic resection in diseased liver is safe and may affect the improvement of outcome.

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### Laparoscopic Splenectomy and Pericardial Devascularization for Treatment of Portal Hypertension Due to Liver Cirrhosis

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*De-fei Hong, MD, Xue-yong Zhen, MD*

Department of General Surgery, Sir Run Run Shaw Hospital, Zhejiang University, Huangzhou, China

**Objective:** To investigate the safety and efficacy of laparoscopic splenectomy (LS) and pericardial devascularization for treatment of portal hypertension due to liver cirrhosis.

**Methods:** 17 patients with upper GI bleeding due to HBV liver cirrhosis with portal hypertension underwent LS and devascularization of proximal stomach and low part of esophagus. All data of operative time, intraoperative blood loss, recovery time, length of hospital stay, complication, were analyzed prospectively on all patients.

**Results:** Seventeen cases were all successful in laparoscopic splenectomy (LS) and pericardial devascularization. None was converted to open surgery. Operative time ranged from 170 mins to 260 mins (mean 210 mins) and intraoperative blood loss was from 200 ml to 700 ml. The movements of alimentary tract were recovered in 24 hrs to 48 hrs after operation in all cases. All patients could be up walking within 6 hours postoperatively, and their mean hospitalization was 9 days. No major postoperative complication occurred after treatment of plasma transfusion, antibiotics, and abdominal drainage.

**Conclusions:** Laparoscopic splenectomy (LS) and pericardial devascularization for treatment of portal hypertension due to liver cirrhosis are relatively safe and effective. The keys to success included experienced

laparoscopic technique, use of harmonic and careful manipulation.

### Role of Anatomic Hepatectomy Performed Under Vascular Exclusion in Management of Hepatolithiasis

*De-fei Hong, MD, Bin Xu, MD, Shu-you Peng, MD*

Department of General Surgery, Sir Run Run Shaw Hospital, Medical College of Zhejiang University, Hangzhou, China

**Objective:** To evaluate the effect of anatomic hepatectomy for hepatolithiasis.

**Methods:** From May 2002 to March 2005, 53 patients with unilateral hepatolithiasis underwent anatomic hepatectomy with exposure and control of inferior vena cava and main trunk of hepatic veins. The hepatic lobes involved by hepatolithiasis were left lateral lobe (S2, S3) in 12 patients, left lobe (S2, S3, S4) in 26 patients, right posterior lobe (S6, S7) in 8 patients, and right lobe (S5, S6, S7, S8) in 7 patients. Atrophy of involved hepatic lobes was found in 38 patients. Fourteen patients had experienced more than one operation on biliary tract. Nine patients showed the symptoms of acute cholangitis before operation and 4 patients combined with liver abscess.

**Results:** Vascular exclusion was successfully performed on all patients to control the in- and outflow of liver.

The anatomicly resected hepatic lobes were left lateral lobe (S2, S3) in 12 patients, left lobe (S2, S3, S4) in 26 patients, right posterior lobe (S6, S7) in 8 patients, and right lobe (S5, S6, S7, S8) in 7 patients. Except hepatectomy, the additional procedures performed on the patients were choledocholithotomy in 39 cases, choledochojejunostomy in 5 cases. The majority of complications were bile leakage in 3 cases, subphrenic infection in 2 cases and hydrothorax in 5 cases, wound infection in 5 cases.

**Conclusions:** Anatomic hepatectomy under vascular exclusion is effective treatment to eradicate intrahepatic stone foci in case of unilateral hepatolithiasis, and reduce intraoperative blood loss and decrease postoperative

complications.

### Endoscopic Stenting versus Surgical Bypass in Advanced Malignant Distal Bile Duct Obstruction: Cost-effectiveness Analysis

*Somkiat Jumroothavorn, MD<sup>1</sup>, Somkiat Sunpaweravong, MD<sup>1</sup>, Buncha Ovartlarnporn, MD<sup>2</sup>, Uthai Khow-ean, MD<sup>2</sup>, Prinya Soontrapornchai, MD<sup>1</sup>, Vicha Charoonratana, MD<sup>1</sup>*

<sup>1</sup>Departments of Surgery and <sup>2</sup>Medicine, Songklanakarind Hospital, Prince of Songkla University, Songkhla, Thailand

**Background/Aims:** Palliative treatment of obstructive jaundice from advanced tumor at distal bile duct is controversial. The aim of this study was to compare the clinical outcomes and costs between endoscopic stent insertion and surgery.

**Methodology:** The clinical data of 116 patients who were treated with either endoscopic plastic stenting (65 patients) or surgical bypass (51 patients) were reviewed and analyzed.

**Results:** No statistically significant difference was found between the two groups in terms of the length of hospital stay, survival time, cost, effectiveness, and early complications. However, late complications were significantly higher in the stenting group ( $P = 0.007$ ). Recurrent jaundice occurred in 15 stented patients, due to stent blockage with a median time of 3 months for stent blockage, and 1 surgical patient had recurrent jaundice from anastomosis stricture. Late gastric outlet obstruction occurred in one of 36 surgical patients who did not undergo prophylactic gastroenterostomy and one of 65 stented patients developed this complication.

**Conclusions:** Both techniques are equally effective in biliary drainage but the stenting has a higher rate of recurrent jaundice. We recommend surgery for patients with low surgical risk and endoscopic stent in those with short-life expectancy or those unfit for surgery.

## HERNIA

### Risk Factors for Inguinal Hernia in Adult Males: A Case-Control Study

*Christian Fang, MD, Nivritti G. Patil, MD, Wai K. Yuen, MD, Hung Lau, MD*

Department of Surgery, Queen Mary Hospital, Hong Kong University, Hong Kong, China (Hong Kong S.A.R.)

**Background:** Inguinal hernia is a common surgical

pathology in adult males but risk factors for its development remain unclear. A prospective hospital based case-control study was undertaken to identify clinical risk factors associated with the development of inguinal hernia in adult males.

**Method:** Between January 2002 and December 2003, male patients who presented with primary inguinal hernia at the surgical clinic, were matched with a control group

with respect to age and gender. All patients were interviewed by a research assistant using a standardized questionnaire. Univariate and multivariate logistic regression analyses were performed.

**Results:** A total of 1,418 eligible male patients, 709 cases and 709 controls, were recruited. Significant risk factors associated with the development of inguinal hernia included a lighter mean body weight ( $P = 0.028$ ), a shorter mean body height ( $P = 0.009$ ), a higher mean work index ( $P = 0.028$ ), a higher mean total activity index ( $P = 0.004$ ), a positive family history of inguinal hernia ( $P < 0.001$ ,  $OR = 8.727$ ) and chronic obstructive airway disease ( $P = 0.035$ ,  $OR = 2.038$ ). On logistic regression analyses, positive family history of hernia was the only independent risk factor for the development of inguinal hernia.

**Conclusion:** Positive family history of hernia was the most important risk factor for developing inguinal hernia in adult males. Our findings suggest a hereditary element in the development of inguinal hernia and warrant future genetic studies.

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#### Laparoscopic Hernia Surgery Training: the First Successful Hands-on Workshop in Soft Cadavers (MIST-SC in LH)

*Suthep Udomsawaengsup, MD, Jirawat Pattana-arun, MD, Tanwa Tansatit, MD, Suppa-ut Pungpapong, MD, Bunchoo Sirichindakul, MD, Bunthoon Nonthasoot, MD, Kitaya Kitayakirana, MD, Patpong Navicharern, MD*

Minimally Invasive Surgery Center, Department of Surgery, Faculty of Medicine, Chulalongkorn University, Bangkok

**Aims:** The purpose of this study was to evaluate the groin anatomy, tissue planes of soft cadavers and the satisfaction in integration each laparoscopic hernia surgery steps in soft cadaver setting

**Methods:** Sixteen active laparoscopic surgeons from across the country were invited to attend the hands-on laparoscopic hernia surgery workshop in soft cadavers. Eight soft cadavers were scheduled for both totally extraperitoneal hernioplasty (TEP) and transabdominal preperitoneal hernioplasty (TAPP). All procedures were supervised by 8 experienced laparoscopic hernioplasty surgeons. The groin anatomy, tissue planes, the satisfaction in performing each steps of the procedures were recorded for evaluation.

**Results:** The groin anatomy, the tissue planes were very well preserved with mean score of  $4.72 \pm 0.45$ . All surgeons were satisfied with the steps in performing laparoscopic hernioplasty, with the mean score of  $4.97 \pm 0.18$ . All the planned procedures were completely performed with great satisfactory results.

**Conclusions:** The laparoscopic hernia surgery training in soft cadaver was successful with great satisfaction. This integration of basic and advanced laparoscopic skills into the soft cadaver setting would be the step in risk minimizing and shortcut to competency.

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#### A Comparison Study of Mesh Plug Herniorrhaphy versus Lichtenstein versus Bassini Operation: A Prospective Clinical Trial

*Phatchara Horharin, MD, Chumpon Wilasrusmee, MD, Kunlanid Cherudchayaporn, MD, Nateecha Pinyakul, MD, Oraphan Phanpradit, MD, Ntnattanun Promsopha, MD*

Department of Surgery, Ramathibodi Hospital, Bangkok

**Background:** Operations for the cure of inguinal hernia are the most common surgical procedures, but the most effective surgical technique is unknown and the overall number of recurrence varied between 1-10% at 5 years. The diversity of surgical technique and implanted materials are crucial. For the result and cost associated with hernia repair in this study, we purpose to determine if our hand-made Mesh Plug used for inguinal hernia repair is as effective and safe as other type of herniorrhaphy.

**Patients and Methods:** 94 patients with primary diagnosis of inguinal hernia were prospectively included in our study. Since 1 June 2003 - 1 January 2004, 25 patients were treated with our hand-made Mesh Plug herniorrhaphy, 26 patients were treated with Lichtenstein operation and 36 patients with Bassini operation. The primary outcome was recurrence of hernia at 1 year and secondary outcomes include operative complications and hospital stay.

**Results:** All 94 patients were operated. There was no postoperative mortality in this study. Three patients had recurrence after Bassini operation. No recurrent hernia was found in Lichtenstein and Mesh Plug herniorrhaphy. Groin swelling and echymosis were seen in 2 patients (1 in Mesh plug herniorrhaphy, the other in Lichtenstein). No surgical site infection occurred in all patients. Operative time for hand-made Mesh Plug Herniorrhaphy was 45-75 min (mean 60 min), for Lichtenstein Herniorrhaphy 30-120 min (mean 82 min) and for Bassini operation 30-135 min (mean 82 min).

**Conclusions:** Our hand-made Mesh Plug herniorrhaphy is a safe operation. The cost of mesh plug material that tailored from mersilene mesh was low. Recurrence rate was less than Bassini operation but equal to Lichtenstien operation. Postoperative complication did not differ in all operations.

## INVESTIGATION

### Heat Derived from Operative Lamp in Minor Operative Surgery

*Kasem Limrungeunyong, MD, Narain Chotirosniramit, MD*

Maharaj Nakorn Chiang Mai Hospital, Faculty of Medicine, Chiang Mai University, Chiang Mai

**Background:** During operation, light is required in order to provide clear visibility to facilitate surgery. In minor operation, light from operative lamp is found as most important. However, different heat rate from lamp effects in healing process.

**Objective:** To compare the heat derived from lamp without filter and lamp with filter whether they are harmful to the patients.

**Methods:** The variation of thermometer was studied. 50 ml. of purified water was filled into 3 of 100 ml. glass

tubes, 1st glass tube used for room temperature control, 2nd glass tube served for 8 watts lamp without filter, and 3rd glass tube served for 50 watts lamp with filter. Lamp was arranged in distance of 60 cm. from glass tube no. 2 & 3. Recorded the initial temperature and recorded every 5 minutes until 30 minutes. Lamp was rearranged in distance of 80 cm. and 110 cm. with the previous method of experiment.

**Results:** Heat from lamp without filter causes the increase of water temperature to 2, 1.8 and 1.1°C from distance of lamp set at 60, 80 and 110 cm. respectively.

**Conclusions:** Standard lamp with filter can diminish the heat. In long term minor operation, it is recommended to use industrial standard lamp with filter. However handmade lamp which is more economical can be used in short term minor operation.

## SPLEEN

### Tuberculous Splenic Abscesses: Clinical, Imaging Features and Outcome of Treatment

*Van Hai Nguyen, MD*

Department of General Surgery, University of Medicine and Pharmacy, Ho Chi Minh City, Vietnam

**Aims:** To describe clinical and imaging features and to review our experience in the treatment of tuberculous splenic abscesses.

**Methods:** Charts of all patients treated for tuberculous splenic abscesses at Nhan Dan Gia Dinh Hospital between 2000 and 2004 were reviewed. Definite diagnosis was based on pathohistological examination of surgical specimen of the spleen.

**Results:** There were 8 patients including 5 men and 3 women with their ages ranged from 20 to 56 years. Clinical manifestations were nonspecific and included fever of unknown origin (75.0%), abdominal pain (62.5%), and loss of weight (37.5%). Only 1 patient had advanced pulmonary tuberculosis and 1 patient was infected with HIV. Raised ESR was noticed in 7/7 patients but IDR was positive in only 1 patient. In imaging features, multiple hypoechoic splenic lesions were demonstrated on abdominal sonography in 8/8 patients (100%) while multiple low density splenic lesions were shown on abdominal CT scan in 6/6 patients (100%). All patients were treated by splenectomy and postoperative anti-

tuberculous therapy. No patient died and only 1 patient had wound infection in postoperative period.

**Conclusions:** Tuberculous splenic abscesses should be suspected in patients admitted with fever of unknown origin and abdominal pain. Because of nonspecific clinical features, abdominal sonography, CT scan and ESR proved helpful in making preoperative diagnosis. For treatment, splenectomy with postoperative anti-tuberculous therapy may be the effective local and general eradication.

### Benefits of Laparoscopic Splenectomy

*Kenichi Hakamada, MD, Yutaka Umehara, MD, Norihisa Kimura, MD, Shunji Narumi, MD, Mutsuo Sasaki, MD*

Department of Surgery, Hirosaki University School of Medicine, Hirosaki, Japan

We evaluated safety and efficacy of laparoscopic splenectomy (LS) by comparing it with open splenectomy (OS). Total of 38 splenectomies [7 laparoscopic splenectomy (LS), 3 hand assisted laparoscopic splenectomy (HALS) and 28 open splenectomy (OS)] were performed in our department from 1990 to 2003. Indications of splenectomy for those patients included splenomegaly in 12 cases, idiopathic thrombocytopenic purpura (ITP) in 9 cases, hereditary spherocytosis in 6 cases and neoplastic disease of the spleen in 2 cases. Mean operative time for LS



was 231 min and it was significantly longer than that of OS. Mean blood loss during LS was 495 ml and there was no significant difference in two groups. Only one laparoscopic splenectomy was converted into OS due to accidental hemorrhage caused by divergence of hemostatic clip. Accessory spleen was observed in 1 case in each group. In LS group, mean hospital stay was 6 days and it was

significantly shorter than that of OS. There was no recurrent thrombocytopenia in LS group. Laparoscopic splenectomy (LS) is a safe procedure and superior to OS in the point of patient quality of life after the operation. Curative effect of LS was satisfying and it is thought to be the first choice for ITP resistant to conservative treatment. HALS was a good option for neoplastic disease of the spleen.

## PRE/POST OPERATIVE CARE

### Preoperative and 24 Hours Postoperative Changes of Peak Expiratory Flow Rate Predicting Postoperative Pulmonary Complications

Jongjate Youngsakul, MD, Vitoon Chinswangwatanakul, MD  
Department of Surgery, Faculty of Medicine, Siriraj Hospital, Mahidol University, Bangkok

**Background:** Postoperative pulmonary complications (PPCs) are common problems after abdominal operations. Their incidence varies from 10% to 69% for atelectasis and from 9% to 40% for postoperative pneumonia. Many studies have investigated risk factors and risk index for predicting PPCs, but they are very complicated and cannot be used clinically to predict risk.

**Objective:** To develop a simple, reliable, and safe diagnostic tool for early detection of postoperative pulmonary complications.

**Design:** Prospective cohort study.

**Setting:** Siriraj Hospital Medical School, Mahidol University, Bangkok.

**Subjects:** A series of 151 consecutive patients scheduled for elective abdominal operations between 1 September 2003 and 31 August 2004. Peak expiratory flow rate (PEFR) the night before operation and every 24 hours after operation were measured. The data were analyzed using univariate and multivariate regression analyses with respect to postoperative pulmonary complications.

**Results:** A total of 15 patients (9.9%) developed postoperative pulmonary complications. Univariate analysis demonstrated that pre-operative PEFR (PrePEFR) and 24 hours postoperative PEFR (PostPEFR) predicted post-operative pulmonary complications. On multivariate regression analyses, the PEFR Score was developed and calculated as  $(17.24 \times \text{Malignant}) - (0.16 \times \text{PostPEFR})$ . A cut-off point value is -4.68. It has diagnostic sensitivity of 80% and specificity of 73.5%.

**Conclusion:** 24-hour postoperative PEFR is a simple and valuable bedside method for predicting postoperative pulmonary complications.

### Novel Nutritional Index in Maharaj Nakorn Chiang Mai Hospital

Wilaiwan Chongruksut<sup>1</sup>, Kittipan Rerkasem<sup>1</sup>,  
Sakda Pruenglampoo<sup>3</sup>, Wattana Kittipathanapong<sup>1</sup>,  
Wasana Ko-iam<sup>1</sup>, Worawit Khangtragool<sup>1</sup>,  
Anon Chotirosniramit<sup>1</sup>, Prasong Tienboon<sup>2</sup>

Departments of Surgery<sup>1</sup>, Pediatrics<sup>2</sup>, and Research Institute for Health Sciences<sup>3</sup>, Faculty of Medicine, Chiang Mai University, Chiang Mai, Thailand

**Background:** Body Mass Index (BMI) is well known as the index of the nutritional status in adults. BMI is the weight (in kilogram) divided by the height squared (in meter). In 2003 Pruenglampoo, our researcher, introduced a new index, the Height-Weight Difference Index (HDWI), based on community studies. HDWI is calculated by the simple formula: weight (in kilogram) subtracted from height (centimeter). HDWI has never been used in patients.

**Objectives:** To correlate HDWI with other nutritional indices in surgical patients.

**Setting:** General Surgical C Unit at Maharaj Nakorn Chiang Mai Hospital.

**Methods:** Three hundred and fifteen patients admitted for surgery were nutritionally assessed on admission. Weight, height and abdominal circumference were measured. The relationship between HDWI and BMI as well as HDWI and abdominal circumference was conducted by using the Pearson product moment correlation coefficient (r).

**Results:** Three hundred and fifteen patients were included in this study. There were 115 females and the mean age was 51.64 (SD = 14.82). There was a significant correlation between HDWI and BMI ( $r = -0.965$ ,  $P < 0.01$ ) also the HDWI correlated markedly with abdominal circumference ( $r = -0.633$ ,  $P < 0.01$ ).

**Conclusion:** This study showed that HDWI correlated very well with previous established nutritional index. Since HDWI is much simpler than other methods, patient may use it to monitor their nutrition status in the future.

### Nutritional Status of the Pre- and Post-Operative Surgical Patients in Maharaj Nakorn Chiang Mai Hospital

Wasana Ko-iam, MD<sup>1</sup>, Kittipan Rerkasem, MD<sup>1</sup>,  
Anon Chotirosniramit, MD<sup>1</sup>, Worawit Khangtragool, MD<sup>1</sup>,  
Wilaiwan Chongruksut, MD<sup>1</sup>, Watana Kuttipattanapong, MD<sup>1</sup>,  
Prasong Tienboon, MD<sup>2</sup>

Departments of Surgery<sup>1</sup> and Pediatric<sup>2</sup>, Faculty of Medicine, Chiang Mai University, Chiang Mai

**Background:** Studies indicated that hospital malnutrition is common. In Thailand, limited data on nutritional status of surgical patients were noted, especially on the documented change of nutritional indexes during hospital stay.

**Objective:** This study reported the nutritional status on the admission and documented change in surgical patients during hospital stay at Maharaj Nakorn Chiang Mai Hospital.

**Setting:** General Surgical C Unit at Maharaj Nakorn Chiang Mai Hospital.

**Materials and Methods:** Three hundred and fifteen

patients (200 males, 115 females) aged 15-81 years who underwent surgery were nutritionally assessed on admission and after commencement of oral diet after surgery. Weight, height, left mid arm circumference (MAC) and left triceps skin fold thickness (TSFT) were measured.

**Results:** On Admission 17.6%, 15.2%, 31.1%, 16.3% and 19.7% of patients had body mass index (BMI) <18.5, 18.5-20.0, 20.1-23.0, 23.1-25.0 and >25.0 kg/m<sup>2</sup>, respectively. The prevalence of under nutrition, defined by either TSFT or MAC of less than the 10th percentile, were 62.4% and 83.2% respectively. During postoperative period, 35.5% of patients lost weight (2.3% had clinically significant weight loss). This figure was 61.4% for patients who underwent gastrointestinal surgery.

**Conclusions:** The prevalence of hospital malnutrition (BMI < 18.5 kg/m<sup>2</sup>) in surgical patients at Maharaj Nakorn Chiang Mai Hospital appeared to be similar to those of previous reports. Clinically significant weight loss after surgery was more common in patients who underwent gastrointestinal surgery than other types of surgery.

## TRANSPLANT

### The Safety Outcome of Living-related Donors Liver Transplantation in Children at Ramathibodi Hospital

Supoj Laiwattanapaisal, MD, Surasak Leelaodomlimpi, MD,  
Suthus Sriphojanart, MD, Sumate Teeraratkul, MD

Department of Surgery, Ramathibodi Hospital, Bangkok

**Background:** The shortage of organ is a great problem for liver transplantation. There are so many strategies to increase utilization of organ. For example using marginal donor, split cadaver liver, reduced graft size and living-related liver transplant (LRLT). The advantages of living donor liver transplant include normal liver function with no adverse event, short ischemic time elective operation, potential immunology, but a lot of concern is safety outcome of donors (morbidity mortality, complication) and liver regeneration.

**Objective:** Our study was designed to assess the safety outcome, the liver regeneration and the changing synthetic function of liver after transplantation.

**Materials and Methods:** This study is a retrospective study with non-comparative study between March 2001 and August 2004 at Ramathibodi Hospital. Nine living donors for liver transplant were parents of recipients; five fathers

and four mothers. All were performed with left lateral resection. Anatomy, graft volume of liver donors and post liver regeneration were evaluated by CT scan. The data outcome was analyzed and interpreted in form of percentage, proportion and mean  $\pm$  SD.

**Results:** There was no mortality in our study. Complication of minor bile leakage occurred in 2 cases. The average blood loss, blood transfusion and anesthetic time were  $787 \pm 387$  ml,  $377 \pm 165$  ml, and 7 hrs respectively. The liver enzyme markedly increased in the first two weeks and then decreased gradually until normal about 3 months later. The coagulogram (PTT, INR) was increased and decreased in the same timing as the liver enzymes. Serum albumin was markedly decreased and then increased in the first two weeks. The whole liver volume regenerated its size to 89.91%, 81.80%, 91.39%, 94.90% at 3, 6, 12, 18 months respectively. The segment 4 volume and regeneration rate decreased after liver transplant.

**Conclusion:** Shortage of organ donor is a problem at present. Alternatively, LRLT relieves the shortage especially in children. But it still has operative risk and complication for donors.

## THYROID

### Endoscopic Thyroidectomy (Rigid Laparoscope): Complete Approaches to Benign Thyroid Nodules.

*Suthep Udomsawaengsup, MD, Suppa-ut Pungpapong, MD, Patpong Navicharern, MD*

Department of Surgery, Faculty of Medicine, Chulalongkorn University, Bangkok

**Introduction:** The use of endoscopic procedure for benign thyroid nodules has been proved to be safe, and has been developed rapidly in recent years. The results are promising with good cosmetic results and some reported safer and quicker recovery. The authors decided to show the complete comprehensive approaches and surgical details both for unilateral and bilateral benign thyroid nodules.

**Objective:** To demonstrate a comprehensive approach for benign thyroid nodules, comparative endoscopic to open cervical anatomy and surgical details in both axillary approach for unilateral nodule and chest wall approach for bilateral nodules. Finally, to reflect experiences in 51 cases at Chulalongkorn Minimally Invasive Surgery Center.

**Setting:** Chulalongkorn Minimally Invasive Surgery Center, Department of Surgery, Faculty of Medicine, Chulalongkorn University.

**Conclusions:** Unilateral benign thyroid nodule of less than 6 cm is eligible for Transaxillary Endoscopic Thyroidectomy. Larger or bilateral nodules are suitable for Transchest wall Endoscopic Thyroidectomy. The results are very impressive.

## ESOPHAGUS

### Esophagectomy with Three-Fields Lymph Node Dissection in A Patient with Aberrant Right Subclavian Artery

*Masanori Ohara, MD, M. Ishizaka, MD, N. Iwashiro, MD, H. Hashida, MD, K. Komuro, MD, T. Ishidate, MD, K. Yonezawa, MD*

National Hakodate Hospital, Hakodate, Hokkaido, Japan

Lymph nodes dissection around both of recurrent nerves is important to thoracic esophageal carcinoma. The aberrant right subclavian artery is usually associated with the non-recurrent inferior laryngeal nerve. We report a patient with aberrant right subclavian artery managed successfully with esophagectomy with three-field lymph nodes dissection.

A 68-year-old female presented with dysphagia. Upper gastrointestinal radiographs demonstrated a 9 cm distal esophageal mass and compression from the mediastinal organ in the upper esophagus. Biopsies revealed squamous cell carcinoma. Thoracic computed tomography showed the aberrant right subclavian artery passed between the esophagus and the spine. Esophagectomy with three-field lymph node dissection was performed safely. The right recurrent nerve was not seen, and the two non-recurrent inferior laryngeal nerves were preserved.

Post-operative course was uneventful and hoarseness was not observed. There was no lymph node metastasis. The patient is alive without recurrence of disease. Non-recurrent of the inferior laryngeal nerve always results from

a vascular anomaly during embryonic development of the aortic arches. The rate of the anomaly has been reported from 0.2% to 2.2%. It can be easily suspected preoperatively from thoracic computed tomography. The right non-recurrent inferior laryngeal nerve with aberrant right subclavian artery is essential information for the esophageal and thyroid surgeon.

### Absence of Epstein-Barr Virus in Esophageal Squamous Cell Carcinoma

*Chairat Bunchaliuew, MD<sup>1</sup>, Somkiat Sunpaweravong, MD<sup>1</sup>, Winyu Mitranun, MD<sup>2</sup>, Puttisak Puttawibul, MD<sup>1</sup>*

Departments of Surgery<sup>1</sup> and Pathology<sup>2</sup>, Songklanakarind Hospital, Prince of Songkla University, Songkhla

**Background:** EBV infection has also been implicated in the development of a variety of malignancies including nasopharyngeal carcinoma, gastric carcinoma and lymphoma. An association between EBV and esophageal squamous cell carcinoma (ESCC) is also suspected. There are both negative and positive studies concerning this and the theory is still controversial.

**Objective:** The aim of this study was to identify a connection between ESCC and the EBV.

**Methods:** Surgical specimens were collected from 104 patients with esophageal squamous cell carcinoma who underwent esophagectomy between January 1998 and

December 2003 at Prince of Songkla University Hospital. An in situ hybridization (ISH) study for Epstein-Barr Virus (EBV) mRNA was performed on formalin-fixed, paraffin embedded tissue using the Epstein-Barr Virus Probe ISH Kit. The EBV probe hybridized to abundantly expressed Epstein-Barr Virus encoded RNA (EBER) transcripts which are concentrated in the nuclei of latently infected cells.

**Results:** One hundred and four patients ranged in age from 43 to 76 years (median age = 63 years), 82 of patients were male, and 22 were females. The EBER-ISH did not show the presence of EBV in tumor cells in any cases. The EBER signal was present in only a few of the tumor-infiltrating lymphocytes (TILs) surrounding the carcinoma in 5 cases.

**Conclusions:** The EBV is not associated with esophageal squamous cell carcinoma. The EBV positive TILs, like other lymphocytes, are found as in other tissues.

### Gastrointestinal Stromal Tumors (GISTs) of the Esophagus

Masanori Ohara, MD, M. Ishizaka, MD, N. Iwashiro, MD, H. Hashida, MD, K. Komuro, MD, T. Ishidate, MD, K. Yonezawa, MD

Department of Clinical Research, National Hakodate Hospital, Hakodate, Hokkaido, Japan

Gastrointestinal stromal tumors constitute the largest category of primary non-epithelial neoplasms of the stomach, small bowel and colon. Rarely, they occur in the esophagus. Recent work indicates that the interstitial cell of Cajal might represent a possible histogenetic origin for GISTs. Imatinib mesylate is a small molecule tyrosine kinase inhibitor, which is able to target KIT. KIT is extensively expressed in GIST.

We present a case of GIST arising from the esophagus, outline the pathological features, and clinical course, effectiveness of imatinib mesylate. A 73-year-old man was referred to our hospital with posterior mediastinal tumor. Computed tomography showed hetero-density tumor beside esophagus. Upper gastro-esophageal endoscopy showed compression and normal mucosa. We suspected esophageal

submucosal tumor or mediastinal neurogenic tumor.

Operative method was tumor resection with esophageal wall by right thoracotomy. Pathological examination revealed c-kit positive GIST. The patient had recurrence 9 months after surgery. He received imatinib 400mg per day for 8 months. He kept stable of disease for about ten months, but died by other disease.

### Analysis of Risks Factors for Pulmonary Complication after Esophagectomy

Chusaeng Teerawiwachai, MD

Department of Surgery, Songkhlanagarind University, Hatyai

**Objective:** Pulmonary complications are common and are serious after esophagectomy for cancer treatment. Its prediction may help in the selection of patient for a preoperative preparation.

**Methods:** We performed a retrospective analysis from the data of 103 patients diagnosed with esophageal cancer who underwent a transthoracic esophagectomy from January 1997 to December 2002. Preoperative characteristics and operative information were analyzed for a correlation between patient risk factor and pulmonary complications (pneumonia, atelectasis, prolonged intubation of more than 48 hours).

**Results:** Complete data were available in 103 patients. Surgical procedures included right thoracotomy with intrathoracic anastomosis (n = 56), right thoracotomy with cervical anastomosis (n = 44), and left thoracotomy with intrathoracic anastomosis (n = 3). Pulmonary complications occurred in 54 patients (pneumonia in 28 patients, atelectasis in 12 patients and prolonged intubation in 32 patients). There was no significant correlation between sex, age, BMI, albumin, lung function tests and pulmonary complications. However, a longer operative time was associated with a higher incidence of prolonged intubation of more than 48 hours.

**Conclusion:** Operative time is a significant risk factor for pulmonary complication resulting from a transthoracic esophagectomy especially in cases of prolonged intubation.

## UPPER GI TRACT

### Economic Loss of Upper GI Injuries from Corrosive Agents

Pakorn Boonsakulsopit, MD, Suphakarn Techapongsatorn, MD, Anan Manomaipiboon, MD

BMA Medical College and Vajira Hospital, Bangkok

**Introduction:** Upper GI injuries from corrosive agents

can cause mortality or long term disability especially in severe cases. These conditions consume many resources. Then, economic analysis should be performed for supporting the preventive strategies.

**Research Design:** Economic analysis was performed to estimate the economic burden of upper GI injuries from



corrosive agents using prevalence based approach including both direct and indirect costs.

**Methodology:** Prevalence based approach was used to assess corrosive ingestion related costs. Direct health care costs and productivity loss were analyzed. Direct health care costs were estimated from spending on emergency care, hospital care, rehabilitation and medicines by using the prices of medical charges from Ministry of Public Health and the price lists of medicines and medical instruments of BMA Medical College and Vajira Hospital. The productivity loss was estimated from lost working days.

**Results:** From the epidemiological data, the estimated self-harm injuries were 31,911 cases (30,690-33,418) per year and the estimated toxic agent ingestion were 14,679 cases (14,117-15,372) per year. From these approximations, the estimated numbers of patient with corrosive ingestion were 3,000 cases per year (2,700 cases intentional and 300 cases unintentional). The cost per 1 patient was 135,589 Baht for intentional ingestion, 143,885 Baht for unintentional ingestion and 3,720.90 Baht for safety schemes, supposing. Thus, the estimated annual corrosive ingestion related costs were 400 million Baht.

**Conclusion:** Economic loss from ingestion of corrosive agents was a part of toxic exposure in injuries related burden that is listed in the leading health problems. The estimated total annual cost was 400 million Baht. Supposing safety scheme is possible, this economic loss will decrease markedly.

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### The Effectiveness of Dilution after Ingestion of Corrosive Agents

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*Watchara Punchaarnon, MD, Suphakarn Techapongstorn, MD, Vasin Chotvanich, MD, Anan Manomaipiboon, MD*  
BMA Medical College and Vajira Hospital, Bangkok

**Introduction:** Dilution or neutralization by various kinds of substances is still recommended in many literatures and labels to reduce injuries after ingestion of corrosive agents. However, the effectiveness of this technique is not clear.

**Research Design:** Randomized controlled study in animal for effectiveness study and in vitro study to measure the volume of water for dilution a highly corrosive acid.

**Methodology:** At first, 18 male Sprague Dawley rats were divided equally into 3 groups. After fasting for 18 hours to ensure stomach emptying, 1 ml. of 30% of hydrochloric acid was administered into esophagus via a plastic catheter. The first group was the control and the rest were the treatments. In treatment groups, dilution with 1 ml. of water was done 10 minutes later in one group and 30

minutes later in the rest. The rats were sacrificed at 60 minutes. After that, esophagus and stomach were dissected. The specimens were fixed and sent for pathological study. The pathologists did not know the details of experiment. Secondly, distilled water was mixed gradually to decrease acidity of hydrochloric acid and pH level was monitored. The experiments were stopped when the pH was equal to 2, that is the standard cut point of corrosive property. The volumes of distilled water were recorded.

**Results:** The treatment groups had more injuries than the control but these differences were not statistically significant (p-value = 0.22). These finding did not support the initial management by dilution as mentioned in many documents. Furthermore, the volumes of distilled water were 7.8 and 13.7 times of initial hydrochloric acid volumes (17% and 30% w/w) to increase the pH of highly strong acid to 2.

**Conclusion:** Initial management with dilution should not be considered in corrosive ingestion. This method can induce more injuries and complications.

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### Types of Corrosive Substances Existing in Household Cleaner Products

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*Anant Boonyakitnotai, MD, Jiraphorn Bumrungsak, MD, Yuthapong Sangpayup, MD, Anan Manomaipiboon, MD*  
BMA Medical College and Vajira Hospital, Bangkok

**Introduction:** Toxic exposure from household products is increased significantly especially in urban areas. Fortunately, majority of these products are relatively safe when comparing to the agricultural or industrial products, excepting the corrosive products. Most of disability and death from household products came from corrosive substances existing in household cleaner products. Thus, these corrosive substances existing in household products in Thailand should be reviewed and summarized.

**Research design:** Descriptive study

**Methods:** The database of registered household cleaner products and its toxic components up to the year 2003 were collected and analyzed using descriptive statistics after approval from the government agency (Toxic Control Division, FDA).

**Results:** There were 5,107 toxic substances in more than 2,000 registered household cleaner products. Eight hundred and sixty four toxic substances (16.9%) were classified as corrosive components by the EU and OECD criteria. These corrosive substances were acid-base, bleaching agents, cationic surfactants, disinfectants, complexing agents and preservatives with 51.7% (95%CI 48.3-53.1), 23.1% (95%CI 20.4-26.1), 13.2% (95%CI 11.0-

15.6), 7.5% (95%CI 5.9-9.5), 3.8% (95%CI 2.6-5.3), and 0.6% (95%CI 0.2-1.3) respectively.

**Conclusions:** Acid-base was the most common corrosive substances in household cleaner products. However, the other corrosive substances that should be recognized by the physicians and health personnel were bleaching agents, cationic surfactants, disinfectants, complexing agents and preservatives.

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### Surgical Management of Duodenal Diverticular Bleeding

*Teddy Arifin Poernama, MD, Arnold Simanjuntak, MD*  
Cipto Mangunkusumo Hospital, Jakarta, Indonesia

Duodenal diverticula (DD) can be classified into extraluminal type and intraluminal type. This abnormality is commonly encountered in patients above 30 years old (mean 50 years), no gender predilection, and 90% of cases are solitary lesions and commonly occupying the second portion of duodenum. Incidence of DD was 1-5% in the upper gastrointestinal series, 23% in endoscopic/ERCP series, and up to 22% in autopsy series. However, symptomatic DD are less than 10% and only in 1% needs surgery as the result of complications. Although rarely encountered, duodenal diverticular bleeding should be suspected if the source of gastrointestinal bleeding is obscured.

We report 4 consecutive cases of duodenal diverticular bleeding surgically treated between 2001 and 2003. Devascularization and invagination of the diverticula were performed in 2 cases, while excision was performed in others with good results. Intraoperative endoscopy, which was performed in 3 cases during the operation, was very helpful.

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### Unintentional and Intentional Ingestion of Corrosive Agents Existing in Household Cleaner Products: Epidemiology and Its Preventive Measures

*Anan Manomaipiboon, MD, Waigoon Stapanavatr, MD, Suphakam Techapongstorn, MD, Burapa Kanchanabat, MD*  
BMA Medical College and Vajira Hospital, Bangkok

**Introduction:** According to the toxic exposure surveillance systems and disadvantage of disease registry by ICD-10 in Thailand, the epidemiological data of corrosive ingestion is neglected. Now, upper GI injuries from corrosive agents are increased in number and make a lot of problems for surgeons taking care of these patients. Moreover, any preventive strategies are not planned before.

**Research Design:** Multidimensional study consisted

of prospective data collection from toxic exposure surveillance for epidemiological study, descriptive study of corrosive injuries, review of present regulations in Thailand and developed countries, and qualitative study for prevention.

**Methods:** This project was composed of many sub-projects in different dimensions. Firstly, an epidemiology of toxic ingestion was studied in 6 tertiary hospitals for a period of 12 months. Secondly, literatures of epidemiology, treatment, regulation about corrosive agent existing in household cleaner products were reviewed. Thirdly, the database of toxic agent in household cleaner products was constructed. Fourthly, an economic burden from corrosive ingestion was analyzed. Lastly, preventive strategies were summarized and presented.

**Results:** The most common ingested toxic substances were medicines, household products and agricultural insecticides/herbicides respectively. There was a multiplicity of household products in the markets but majority were less toxic. Unfortunately, the household cleaner products having corrosive substances especially toilet cleaners were the most dangerous of household products. Its main component was hydrochloric acid that can cause severe injuries to the upper alimentary tract and leading to permanent disability or death. Nowadays, there are neither specific treatments nor detoxification for decreasing the injuries.

**Conclusions:** There was a wide diversity of toxic substances in household products but the most dangerous was corrosive substances existing in household cleaner products. Today, household products registration, label and hazard symbols on the containers are compulsory by law. However, these strategies cannot prevent toxic exposures from household products effectively. In conclusion, allowing only less toxic or non toxic substances in all household products is the best prevention for decreasing unexpected injuries, disability or death. Fortunately, the government agency (FDA and Epidemiologic Department of Ministry of Public Health) already recognized the evidence from this project and is in progress of setting the safety level of all household products and to revise the toxic exposure surveillance system.

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### Prognostic Factors for Corrosive Ingestion

*Chittinad Havanond, MD, Piyalamporn Havanond, MD*  
Faculty of Medicine, Thammasat University, Klong Luang, Pratumtani, Thailand

**Objectives:** In Thailand, 40-60% of attempted suicides were by means of poison ingestion. This study was to

identify factors which determine the severity of upper gastrointestinal tract injuries in corrosive ingestion patients, and to obtain an algorithm to distinguish patients who need special investigation.

**Design:** Analytical study. Prospective data collection

**Setting:** University Hospital (Thammasat Chalermprakiat) located in an industrial area.

**Participants:** We recruited all patients who had a definite history of corrosive ingestion. All patients had flexible endoscopic examination within 24 hours after admission.

**Main Outcome Measures:** Dependent variable was severity of upper gastrointestinal injuries. Predictors were history, present symptoms and physical examination and routine laboratory tests.

**Results:** We recruited 148 adult corrosive ingestion patients. Presenting symptoms and physical examination were major determinant factors. Logistics regression showed significant factors: drooling (Odd Ratio = 117), buccal mucosal injury (Odd Ratio = 32) and white blood cell count >10,000 cell/ cu.mm. (Odd Ratio = 17). The algorithm with sensitivity, specificity, positive and negative predictive values of 95%, 98%, 90% and 99%, respectively, was simple, easy, rapid to access and applicable for medical personals.

**Conclusion:** Based on these simple admission data, we can predict the severity of injury and patient who need further investigations or observation only.

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### Serial Transverse Enteroplasty for Tapering of Short Bowel Syndrome: A Case Report.

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*Monawat Ngerncham, MD*

BMA Medical College and Vajira Hospital, Samsen, Bangkok

**Background:** Short bowel syndrome is associated with significant morbidity and mortality. Complex surgical procedures have been reported to improve motility and absorptive function of the remaining bowel.

**Objective:** To report the result of serial transverse enteroplasty in a short-bowel infant unable to tolerate enteral feeding.

**Institution:** Department of Surgery, BMA Medical College and Vajira Hospital, Bangkok, Thailand

**Results:** A Thai male newborn infant with type IIIA jejunoileal atresia was operated on the 4th day after birth. Laparotomy revealed volvulus and strangulation of the blind end. The strangulated segment was resected, leaving him 45 cm of small bowel without ileocecal valve. The resected end was exteriorized as an ileostomy which was closed 4 weeks later. He was dependent on parenteral nutrition and was periodically suffering from recurrent

bouts of enterocolitis. Contrast study after the remission of an episode of enterocolitis, at 4 months of age, revealed dilation of the distal small bowel without anastomotic stricture. Laparotomy revealed 79 cm of small bowel with dilatation of the distal 15 cm to the diameter of 6 centimeters. Serial transverse enteroplasty (STEP) was performed. Additional 8 cm of small bowel length with reduction of caliber was achieved. The patient tolerated the procedure well and began to have semisolid bowel movements within 5 days after the operation.

**Conclusion:** STEP procedure is a simple bowel tapering and lengthening technique, and can facilitate enteral feeding. It should be considered as an option for the treatment of children with short bowel syndrome.

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### The Incidence and Prognostic Factors of Gastrointestinal Stromal Tumors

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*Pornthep Pratanvanich, MD, Bunthoon Nonthasoot, MD, Voranuch Thanakit, MD, Naruemon Wisedopas, MD, Preecha Ruangvejvorachai, MD*

Departments of Surgery and Pathology, Faculty of Medicine, Chulalongkorn University, Bangkok

**Background:** After Hirota, et al discovered CD 117 in 1998, the majority of the diagnosis of gastrointestinal mesenchymal tumors were changed to Gastrointestinal Stromal Tumors (GISTs). This alteration led to the revolution of diagnosis and treatment of GISTs. This report studied the effect of this great change in the aspect of true incidence and prognostic factors of GISTs at King Chulalongkorn Memorial Hospital.

**Methods:** The authors reviewed the database of mesenchymal tumors of gastrointestinal tract between 2000 and 2004. During this period, 54 patients were collected and the immunohistochemistry was studied, including CD 117. The clinical, pathological, immunohistochemical characteristics were analyzed related to cumulative disease-free survival and survival and multivariate analysis.

**Results:** After the CD 117 staining was done, the incidence of GISTs increased from 12/54 (22%) to 35/54 (65%). Factors that are significantly associated with high tumor recurrence and poor survival were tumor size  $\geq 10$  cm ( $p < 0.0001$ ), mitotic count  $>10/50$  HPF ( $p = 0.0002$ ), Ki67 index  $>10\%$  ( $p < 0.001$ ), p53  $>50\%$  ( $p = 0.002$ ), and incomplete resection ( $p < 0.0001$ ).

**Conclusions:** The breakthrough discovery of CD 117 in GISTs has had great effect on the diagnosis of GISTs at our institute. The previous diagnosis of the majority of other mesenchymal tumors of gastrointestinal tract has been changed to GISTs. This finding also alters the way of

treatment and follow-up in our patients.

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### Sixteen Months Disease Free Survival in Unresectable GISTs after Thyrosine Kinase Inhibitor Neoadjuvant Treatment: A Case Report

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Ake Pugkhem, MD<sup>1</sup>, Kriangsak Jenwitheesuk, MD<sup>1</sup>,  
Narongchai Wongkonkitsin, MD<sup>1</sup>, Chawalit Pairojkul, MD<sup>2</sup>,  
Vajarabhongsa Bhudhisawasdi, MD<sup>1</sup>,  
Thongueb Uttaravichien, MD<sup>1</sup>

Departments of Surgery<sup>1</sup> and Pathology<sup>2</sup>, Faculty of Medicine, Khon Kaen University, Khon Kaen

Thyrosine kinase inhibitor is the standard treatment for advanced unresectable and metastatic GISTs. Eighty percent of patients benefit from this treatment. It can prolong the survival time. From this very impressive result, there are several studies now in progress using this agent as adjuvant and neoadjuvant for the treatment of this interesting condition.

We report a case of 39-year old man presenting with abdominal mass, melena and weight loss. He was operated upon and a huge unresectable mass of intestinal mesentery was found. A biopsy was performed. Spindle cell tumor positive for c-kit protein was confirmed and the diagnosis of GISTs was made. The thyrosine kinase inhibitor was given at the dosage of 400 mg/day. The tumor size had reduced from 18 cm. to 6 cm. in 4 months and complete tumour resection was performed. The patient is now still alive without recurrence 16 months postoperatively.

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### Small Bowel Tumour: A 7 Years' Review

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Joe Fan, MD, Wai Lun Law, MD

Department of Surgery, Queen Mary Hospital, HKSAR, China (Hong Kong S.A.R)

**Introduction:** Small bowel tumour is rare and it comprises less than 2% of all gastrointestinal malignancy. To have a better understanding of this disease entity, we reviewed the data on patients suffered from small bowel tumours in our institution.

**Methods:** Charts of patients operated on for small bowel tumours from January 1998 to December 2004 were reviewed. The clinical presentations, the details of operations, the outcomes and the pathologies were studied.

**Results:** Thirty patients (17 men) with the mean age of 54.9 ± 17.9 years (range: 28 to 87 years) were included. Eight patients suffered from lymphoma (26.7%) and eight with gastrointestinal stromal tumour (26.7%). Other pathologies included primary small bowel adenocarcinoma

(n = 3), secondaries from other primaries (n = 2), and other malignant tumours (n = 3). The most common presentation was abdominal pain (53.3%), followed by bleeding from the tumour (16.7%) and abdominal mass (16.7%). Sixteen operations were performed on an emergency basis (53.3%), twelve of which (75%) were operated on because of peritonitis. Computer tomography was the primary investigation that led to the decision for operation in 46.7% patients. Other indications for surgery included intestinal obstruction (n = 3) or an incidental finding of the tumour (n = 1). Complete resection was possible in 15 patients (50%) and 8 had disseminated disease upon exploration (26.7%). The operative mortality was 6.7% and the operative morbidity was 10%. The median hospital stay was 9.5 days (range: 4-46 days). The histopathology showed malignancy in 16 patients (53.3%) and the overall 5-year survival was 21%.

**Conclusion:** Primary tumours of the small bowel are rare and they have distinct clinical characteristics. The majority of them were malignant and emergency surgery is necessary in over half of the patients.

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### One New Member of BRICHOS Family Related to Gastric Cancer - GDDR Gene

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Jianj Du<sup>1</sup>, Shuy Peng<sup>2</sup>, Kef Dou<sup>1</sup>

<sup>1</sup>Xijing Hospital, The Fourth Military Medical University

<sup>2</sup>The First Affiliated Hospital, Medical School, Zhejiang University

**Aim:** Down-regulated novel genes in gastric cancer were screened. Full-length of novel down-regulated genes were amplified in RACE, to confirm the cDNA property, genomic DNA structure and promotor region of the novel gene and to explore the function of the novel gene in vitro.

**Methods:** cDNA suppression subtractive library was established by counterpart normal gastric mucosa mRNA subtracting gastric cancer mRNA. Sequencing results of 860 positive clones were compared with database of GenBank. Full-length of novel down-regulated genes was amplified in RACE and named by us. Novel gene GDDR cDNA was compared with human genomic DNA and nucleotide database of GenBank. mRNA GDDR in gastric carcinoma and counterpart normal gastric mucosa was detected by Northern blot, located by in situ mRNA hybridization of gastric mucosa, and amplified in 11 human organs. Property of encoded protein was investigated. Promotor region of GDDR was confirmed. Both of GDDR ORF and control were steadily transfected into gastric cell lines 7901 by lipofectamin.

**Results:** 826bp full-length of GDDR genes (AF494509) were obtained. Loss or marked reduction of



GDDR mRNA in gastric carcinoma was confirmed by Northern blot. GDDR mRNA was located in gastric mucous epithelial cells, and only was expressed in gastric tissue. 7739bp GDDR DNA located on chromosome 2p13.3, 21701bp away from CA11. GDDR encoded protein homologed to CA11. Gastric cell lines 7901 transfected by GDDR showed a marked decrease in growth rate by growth curve and MTT test.

**Conclusion:** GDDR is another new member of BRICHOS family related to gastric cancer except CA11.

### Laparoscopic Roux-en-Y Gastric Bypass (Lap RYGB): the First Experience in Thai Morbid Obesity Patients.

*Suthep Udomsawaengsup, MD<sup>1</sup>, Suppa-ut Pungpapong, MD<sup>1</sup>, Chadin Tharavej, MD<sup>1</sup>, Patpong Navicharern, MD<sup>1</sup>, Oraluxna Rodanant, MD<sup>2</sup>, Weerapan Khovidhunkit, MD<sup>3</sup>*  
Departments of Surgery (Minimally Invasive Surgery Center)<sup>1</sup>, Anesthesiology<sup>2</sup>, and Medicine<sup>3</sup>, Faculty of Medicine, King Chulalongkorn Memorial Hospital, Chulalongkorn University, Bangkok

**Background:** Morbid Obesity has been slowly increasing in prevalence and there is a trend to become one of health care problem in Thailand in the future. Roux-en-Y gastric bypass (RYGB) is one of the most effective procedures to sustain weight loss and improve co-morbidity and quality of life.

**Objectives:** The aim of this study was to evaluate the initial experience in performing Laparoscopic Roux-en-Y Gastric Bypass for Thai patients by comprehensive Thai medical team. Retrospective assessment of preoperative evaluation and preparation, peri-operative difficulties and complications, postoperative status and management in patients who underwent Laparoscopic Roux-en-Y Gastric Bypass were studied.

**Methods:** From April 2005 to May 2005, 5 Thai (3 males and 2 females) with morbid obesity who underwent Laparoscopic Roux-en-Y Gastric Bypass at King Chulalongkorn Memorial Hospital were assessed. Preoperative parameters, perioperative data and postoperative status were recorded for evaluation.

**Results:** There were 2 females and 3 males. The average BMI was 52.7 kg/m<sup>2</sup>. Hypertension, hyperlipidemia and diabetes mellitus were most common co-morbidity (80%) and also obstructive sleep apnea (60%). One case (No. 3) was converted to hand-assisted bypass due to adhesion on descending colon and proximal part of jejunum. The mean operative time was 5.2 hr, mean blood loss was 110 ml. Postoperative ICU stay time was 1 day. There was no postoperative complication. All patients

were well-tolerated to postoperative condition. Patients started their meal within 4 days. Mean postoperative hospital stay was 7 days. The average operative cost was 68,000 Baht.

**Conclusion:** Laparoscopic Roux-en-Y Gastric Bypass in our early experience in Thailand under well-prepared comprehensive teams is safe with acceptable morbidity, satisfactory operative and post operative results. The cost of the procedure may be reduced after gaining more experience and with technique modification.

### Outcome of Surgery for Small Bowel Obstruction: An Analysis of Risk Factors

*Oswens S.H. Lo, MD, Wai-Lun Law, MD, Hok-Kwok Choi, MD, Yee-Man Lee, MD, Chi-Leung Seto, MD, Judy W.C. Ho, MD*  
Division of Colorectal Surgery, Department of Surgery, University of Hong Kong Medical Centre, China (Hong Kong SAR)

**Objectives:** This study is aimed to evaluate the factors that might influence the postoperative outcomes of patients with adhesive and non-adhesive small bowel obstruction (SBO).

**Methods:** The medical records of 430 patients (252 men) who underwent 437 operations for SBO between January 1998 and December 2003 were retrospectively reviewed.

**Results:** The mean age of the patients was 64.5 ± 18.4 years. Adhesions were the leading cause of SBO (42.6%). Of the 183 patients with adhesive obstruction, 148 (80.9%) had previous abdominal surgery and 108 (59.0%) had 1 prior operation. Colorectal procedures were the most common prior operations (25.0%). Patients with adhesion-related SBO were significantly younger when compared to those with non-adhesive obstruction ( $p < 0.001$ ). Early operation (within 24 hours after admission) was more common in the non-adhesive group ( $p < 0.001$ ). The occurrence of non-viable bowel strangulation (11.8% vs. 13.9%,  $p = 0.516$ ) and the need for bowel resection (19.4% vs. 24.7%,  $p = 0.185$ ) were similar in the adhesive and non-adhesive groups. The overall hospital mortality was 7.6% and the postoperative complication rate was 35.5%. The median postoperative hospital stay was 8 days. Using logistic regression analysis, the presence of pulmonary disease, prolonged hospitalization, bowel viability and the occurrence of complications were significant factors associated with increased mortality. Old age (age >70 years) was the only factor associated with postoperative complications.

**Conclusions:** Adhesion was the leading cause of small bowel obstruction. Significant factors associated with

hospital mortality were pulmonary disease, prolonged hospitalization, bowel viability and postoperative complications. The incidence of postoperative complications was associated with advancing age.

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**The Clinical Study of the Medical Viscose in Prevention of the Growth in Abdominal Cavity During the Operation on Malignant Tumors in Gastrointestinal Tract**

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*Feng Tao, MD*

No 1 Hospital, Medical College of Shaoxing University, Zhejiang,  
312000 China

**Introduction:** Gastric cancer is one of the malignant tumors with the highest incidence in China. There is a tendency of year- by- year increase in colorectal cancer. The statistics of the malignant tumors in gastrointestinal tract operated in our hospital in the recent 5 years shows the rate of the infiltration on serous membrane close to 50% based on the observation during the operation and

the pathological check after the operation. Many patients have a local relapse. There are changes in the position of the growth in abdominal cavity. The surgical results are not very positive. We have tried to apply medical viscose, the application of ZT viscose on the surface of cancer focus, to prevent and reduce the chances of the fall of cancer cells caused by the mechanical factors in operation.

**Methods:** For the 50 cases of malignant tumors in gastrointestinal tract where tumors have infiltrated the serous membrane observed by naked eyes, before the application of ZT viscose, we use cytology smear examining and immunochemistry dyeing on the surface of cancer focus, the tissue around the cancer and the normal tissue respectively. After the application of ZT viscose, we do the same check on the surface of cancer focus.

**Results:** The test demonstrates positive and reliable results of the application of ZT viscose on the surface of cancer focus to prevent the fall and spread of cancer cells.

**Key Words:** medical viscose; malignant tumor growth