

# Abstracts of the 36<sup>th</sup> Annual Scientific Meeting of the Royal College of Surgeons of Thailand, 14-16 July 2011, Ambassador City Jomtien Hotel, Jomtien, Pattaya, Chonburi, Thailand (Part 2)

## PEDIATRIC SURGERY

### MEDIUM-TERM FUNCTIONAL OUTCOME FOLLOWING ENDORECTAL PULLTHROUGH FOR HIRSCHSPRUNG'S DISEASE

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**Objectives:** Endorectal pull-through is one of the three most popular procedures for Hirschsprung's disease (HD). The objective of this study was to evaluate medium-term functional outcome in patients with HD after endorectal pull-through.

**Methods:** Patients with HD, who were operated by endorectal pull-through during infancy (1-12 months old) between 2002 and 2005, were retrospectively reviewed. Parents of these children were interviewed regarding functional outcome when their children were over 3 years old, based on Krickenbeck criteria, i.e. voluntary bowel movement, soiling and constipation.

**Results:** There were 28 patients who met the inclusion criteria. However, twenty patients (18 boys and 2 girls) were followed up and their parents could be interviewed. The average age at the time of procedure was 3.95 months (range, 1-12 months). Fourteen patients (14/20) were operated via transanal approach. Primary endorectal pull-throughs were performed in 15 patients (75%).

The mean age of the patients at the time of the interview was 5.62 years old (range, 3.0-8.2 years). According to the interview, ninety percent (18/20) had normal voluntary bowel movement. Constant soiling was noticed

in one patient whereas significant constipation was observed in 3 patients.

**Conclusions:** Endorectal pull-through is an effective procedure for HD. However, it is not without problems. In medium term, the majority of the patients had good therapeutic results. Although HD is, at present, treated early in life, medium to long-term follow-up is needed to assess their function outcome.

### PEDIATRIC LAPAROSCOPIC SURGERY: THE FIRST STEP IN A TERTIARY CENTER

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**Background:** Benefit of laparoscopy has been well accepted in many operations. Some of them even become standard approach, such as laparoscopic cholecystectomy (LC), laparoscopic appendectomy. Recently, our institution has adopted these techniques as approach of choice for several operations.

**Objective:** To the result of our early experiences in the laparoscopic surgery in pediatric patients.

**Method:** All of laparoscopic operations in pediatric patient conducted in Division of Pediatric Surgery, the Department of Surgery, Faculty of Medicine Siriraj Hospital were retrospectively reviewed from the first case in April 2007 to May 2011 including both total laparoscopic approach and laparoscopic-assisted surgery.

**Result:** There were 50 patients included in this study.

The age ranges from 19 days to 15 year old (mean 9.0 year old). Average body weight was about 37.7 kg (range: 3-88). The operations were LC (n = 20), laparoscopic appendectomy (n = 9), laparoscopic fundoplication (n = 5), laparoscopic genitourinary surgery (n = 11), laparoscopic-assisted surgery for anorectal malformation and Hirschsprung's disease (n = 4). Operative time slowly decreased over time in more prevalent procedures such as LC and laparoscopic appendectomy without increasing of the complications. Conversion rate was about 2% (n = 1). Oral diet could be started immediately after the operation in 11 patients (mean: 1.32 days, range: 0-14 days). There were two cases which post-operative complications occurred (internal hernia (1 case), and another one had incisional hernia. Both of them occurred after laparoscopic fundoplication.

**Conclusion:** The coming of new era of minimally invasive surgery is inevitable. Many types of the operation become standard approach in pediatric patients. Starting laparoscopic surgery with a standard simple procedure is quite safe and effective. Additionally, this strategy also facilitates laparoscopic surgical skill for beginner.

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#### THE ASSOCIATION BETWEEN THE MIDLINE DIASTEMAS AND THE SUPERIOR LABIAL FRENUM IN THAILAND

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**Background:** The superior labial frenum attachment may develop or relate to the maxillary midline diastema. The studies on the distribution of the superior labial frenum attachment in children are limit, especially in the infantile period.

**Objective:** The purpose of this study was to examine the prevalence of various types of the superior labial frenums that related to the occurrence of a persisting midline diastema in the infant (0 to 6 month of age) and the children (3 to 12 years of age).

**Material and Methods:** A cross-sectional study was conducted. The study population consisted of 124 infants (0 to 6 month of age) from the tongue tie clinic of Siriraj hospital and 303 children (3 to 12 years of age) from the dental clinic of Sikhiu Hospital. The patients were clinically examined for the superior labial frenum attachment location and the association with a persisting midline diastema. Descriptive statistics and SPSS program were used for analysis in this study.

**Results:** 124 infants (0 to 6 month of age), mean age

11.9 days were 58.1% of male and 41.9% of female. The prevalence of the various forms of the superior labial frenum attachment was as follows: mucosal 0%, gingival 29%, papillary 59.7%, and papillary penetrating 11.3%. 303 children (3 to 12 years of age), mean age 8.7 years were 54.1% of male and 45.9% of female. The prevalence of the various forms of the superior labial frenum attachment was as follows: mucosal 18.8%, gingival 70%, papillary 7.3%, and papillary penetrating 4%. The maxillary midline diastema was presented 7.3% in this group and the type of the superior labial frenum that was as follows: gingival 4%, papillary 41%, and papillary penetrating 55%.

**Conclusion:** The maxillary midline diastema was found in the children period 7.3% and the papillary and the papillary penetrating type of the superior labial frenum is the risk factor that associates with a persisting midline diastema. This study may be the pilot study for the further prospective and comparative studies which are needed to conclude the proper management and determine the optimal timing for the resection of the superior labial frenum.

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#### COLONIC ATRESIA: A 14-YEAR REVIEW

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**Background:** Colonic atresia is a rare intestinal anomaly compared with other intestinal atresias. The study of this anomaly is also rarely published in literature.

**Objective:** The aim of this study is to review patients with colonic atresia in a 14-year period at Queen Sirikit National Institute of Child Health (QSNICH).

**Materials and Methods:** Medical records of the patients treated at QSNICH between January 1997 and December 2010 were reviewed. The study emphasized demographic data, clinical presentations and the results of the treatment.

**Results:** Only 18 neonates, 4 males and 14 females, were included for this review. Almost all of the patients were term neonates, except for 2 were preterm with the birth weight less than 2,000 grams. Bilious vomiting, abdominal distension and absence of meconium passage were the common presenting symptoms and signs. Regarding the operative findings, 10 patients (55.5%) had atresia at the ascending colon, whereas atresias at the transverse, descending and sigmoid colons were noted in 2, 3 and 3 cases, respectively. Of the 18 patients, 13 cases were classified in the intestinal atresia type IIIa, 4 cases in type I

and one case in type IV. Initial colostomy were performed in 17 patients and interval colonic anastomosis ranged from 3 to 6 months. Afterwards one patient had a colonic atresia caused by a colonic web and was treated by web excision and colonoplasty. Only one case (5.6%) died due to segmental small bowel volvulus at the age of one month after initial colostomy.

**Conclusions:** Information from the present study revealed the rare incidence of colonic atresia treated at our institute, approximately 1-2 cases per year. Almost all of the patients with this entity should be treated by initial colostomy and secondary colonic anastomosis after 3 months later. Treatment by this method obtained a good result with the survival rate over 90%.

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### LAPAROSCOPIC MANAGEMENT OF NONPALPABLE UNDESCENDED TESTIS

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**Background:** The mainstay of therapy for the palpable undescended testis is surgical orchiopexy with creation of a subdartos pouch. For the nonpalpable undescended testis, however, laparoscopy has now become the treatment of choice as it is the single most accurate modality for diagnosis, localization and surgical management of nonpalpable testis.

**Objective:** To study the laparoscopic management of undescended testes on children in recent years at King Chulalongkorn Memorial Hospital.

**Materials & Methods:** We retrospectively reviewed the records of all boys who underwent orchiopexy for undescended testes at King Chulalongkorn Memorial Hospital. These cases were identified from our computerized database, which dates from January, 2008 to April, 2011. Patients who underwent laparoscopic orchiopexy and testicular vessel transection and orchiopexy laparoscopically in 1 or 2 stages were reviewed in detail.

**Results:** We identified 98 undescended testes in 77 patients. There were 30 nonpalpable testes in 21 patients, 13 of which were identified laparoscopically as intra-abdominal with 1 atretic. Single stage laparoscopic orchiopexy was performed on 7 testes, compared to 8 testes in which the Fowler-Stephens procedure was performed laparoscopically (there was 1 laparoscopic orchiectomy). Thus, 2, 3 and 5 boys with left, right and bilateral nonpalpable testes, respectively, were treated with either laparoscopic orchiopexy or staged Fowler-Stephens orchiopexy.

A 1-stage procedure done on 7 testes involved

laparoscopic mobilization of the testes, spermatic vessels and orchiopexy done in 1 setting.

Otherwise, 8 intra-abdominal testes were managed as 2-stage procedures with laparoscopic clipping and transection of the testicular vessels, followed by laparoscopic orchiopexy approximately 6 months later. In all cases the vessels were clipped and the testes remained undisturbed during stage 1. At stage 2 testicular mobilization via laparoscopic dissection was required to complete stage 2. Bilateral laparoscopic Fowler-Stephens orchiopexy was performed in 2 cases.

At the follow-up to the laparoscopy procedures all testes were in a scrotal or high scrotal position; none had atrophied thus far.

**Conclusions:** Laparoscopic orchidopexy has begun to surpass open surgical exploration as the primary treatment in boys with nonpalpable testes. The transition in surgical procedures from inguinal exploration to laparoscopy has been adopted generally (not only in our institute) because it gives a better surgical outcome and less morbidity. Additionally laparoscopy can obviate the need for such costly investigations as MRI and computer tomography. It can also render unnecessary laparotomy and inguinal exploration. Laparoscopy has proved a valuable diagnostic and therapeutic tool in orchidopexy for the nonpalpable undescended testis at King Chulalongkorn Memorial Hospital.

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### EVALUATION OF RECTAL POUCH LEVEL IN ANORECTAL MALFORMATIONS: COMPARISON BETWEEN INVERTOGRAM AND PRONE LATERAL CROSS-TABLE RADIOGRAPH

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**Background:** Invertogram was used to evaluate the level of blind rectal pouch in neonates with anorectal malformation (ARM) over 80 years ago. In recent years, prone lateral crosstable radiograph (PLCTR) was recommended to demonstrate these anomalies instead of the invertogram with obtaining of equal information as the traditional procedure.

**Materials and Methods:** During January 2009 to December 2010, all of the neonates with ARM who had no evidence of cutaneous, urinary and genital fistula underwent both invertogram and PLCTR for demonstration of the blind rectal pouches. Demographic data and radiographic findings of the patients were collected and analyzed.

**Results:** Twenty six neonates with ARM (23 males and 3 females) were available for the study. Twenty patients (77%) were full term babies, whereas six patients (23%) were prematurity. Invertogram and PLCTR were done at the same time during 13 to 36 hours. Radiographic findings of the two methods in 20 patients were not different, In the remaining 6 cases, the findings of PLCTR were accurate with confirmation by colostomy study (loopogram) or operative findings, while the evidence of invertogram revealed higher than the actual levels

**Conclusion:** Experience from the present study revealed that PLCTR was more accurate than invertogram regarding interpretation of the level of rectal pouch in ARM. PLCTR should be routinely used for evaluation in ARM instead of invertogram

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### **SIMPLE TREATMENT OF GIANT GASTROSCHISIS USING A PLASTIC SPRING LOAD SILO AND A SILICONE SPRING LOAD SILO WITH REINFORCE WING**

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**Background:** Retrospective studies have suggested that use of a preformed silo can effectively help abdominal wall closure in infants with gastroschisis. We simply invented a plastic silo containing a spring load silicone ring to treat gastroschisis infants whose abdominal wall could not be primarily closed. Finally we modified the plastic silo to be a silicone silo with a reinforced wing.

**Objective:** To evaluate outcomes of treatment of giant gastroschisis infants using a plastic silo and a spring-loaded silicone silo with reinforce wing

**Methods:** A preformed spring-loaded silo was placed at bedside or in the operating room to the gastroschisis infants who had large amount of intestine eviscerate out of the abdomen. Gradual reduction and elective abdominal wall closure was done later. The plastic silo were place in 4 patients at the early phase. The silicone silo was used in one patient.

**Results:** Abdominal wall defect could be successfully closed in all infants. Systemic infection occurred in one infant with plastic silo and skin infection occurred in an infant with silicone silo

**Conclusions:** The use of a spring load silo placed at the bedside or in the operating room could avoid urgent surgical intervention. It especially help the infant who had large amount of intestine eviscerated out of the abdomen.

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### **ABDOMINAL LAPAROTOMY USING PERI-UMBILICAL INCISION IN NEWBORNS: A PRELIMINARY REPORT**

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We reported the use of peri-umbilical incision as an abdominal laparotomy approach in 7 newborns. The details of the patients are as follows: Infantile hypertrophic pyloric stenosis (pyloromyotomy) 3 cases, Ileal atresia (bowel resection & anastomosis) 2 cases, duodenal atresia (duodeno-duodenostomy) 1 case, and anorectal malformation (descending colostomy at umbilicus) 1 case.

Firstly, semi-circular incision around the umbilicus was performed. Secondly, subcutaneous space around the incision was created. Thirdly, the abdomen was entered via extended incision of the abdominal sheath. Finally, the targeted organs were eviscerated as necessary. The procedures of all patients were carried out without significant difficulties. There were no wound complications in all patients.

In conclusions, abdominal laparotomy via peri-umbilical incision is feasible and safe in newborns. Cosmetic results are satisfactory.

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### **LIVING RELATED DONOR LIVER TRANSPLANTATION FOR BILIARY ATRESIA CHILDREN: A 10-YEARS REVIEW FROM RAMATHIBODI HOSPITAL, MAHIDOL UNIVERSITY, BANGKOK, THAILAND**

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**Background:** Biliary atresia is not an uncommon disease. In Thailand, there are 60-80 infants born with biliary atresia disease every year. Although the hepaticoporto-enterostomy (Kasai's operation) could create bile drainage for the patients, but their livers already had cirrhosis. The only chance to cure the deadly disease is liver transplantation. Because of lacking of cadaveric liver donors, so we established the first living liver transplant program in Thailand

**Objectives:** To review the outcomes of left lateral segment liver transplants from living donors in biliary atresia children at Ramathibodi hospital during 2001-2011.

**Material and Method:** Thirty three left lateral segment LRLT procedures for biliary atresia patients were performed

during 2001-2011. There were 25 girls and 8 boys. The median age was 1.5 years with a median weight of 9 kg. Donors included 25 mothers and 8 fathers. Methyl prednisolone and FK506 were primary immunosuppressive drugs. Details of the operation, complications and outcomes were studied.

**Results:** There was no donor mortality and low morbidity. Patient and graft survival rates were 90.9%. 2 patients died from preserving failure and 1 patient died from hepatic vein obstruction superimposed with infection. Of the 30 survivals, there were 4 vascular complications (1 arterial occlusion, 2 arterial bleeding and 1 portal vein stricture). Three intestinal complications occurred in the post Kasai's recipients (1 small bowel perforation, 1 colonic

perforation and 1 colono - biliary - fistula). There was an intractable choledochojejunostomy leak because of infection. All of the complications were successfully treated by surgical correction. Late choledocho-jejunostomy stricture occurred in 2 patients, one treated with transhepatic dilatation, the other one treated with re-anastomosis.

There were mild to moderate degree of rejection salvaged by mini-pulse and pulse therapy. 30 patients who received LRLT are living with good quality of life.

**Conclusion:** Living related liver transplantation has good long-term results in biliary children. It helps expanding liver grafts and reduces waiting time for the small patients.

## NEUROSURGERY

### THE OUTCOME FOLLOWING DECOMPRESSIVE CRANIECTOMY OR CONSERVATIVE TREATMENT FOR MALIGNANT MIDDLE CEREBRAL ARTERY INFARCTION

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**Background:** At present, malignant middle cerebral artery (MCA) infarction has high morbidity and mortality rate worldwide. The aim of this study was to identify the mortality rate, to determine the value of decompressive craniectomy in patients who presented with malignant middle cerebral artery (MCA) infarction, to compare functional outcome in elderly patients with younger patients and identify significant risk factors related to the mortality.

**Method:** Medical records of patients with malignant middle cerebral artery (MCA) infarction treated in Bhumibol Adulyadej hospital between January 2008 and April 2011 were reviewed. A total of 82 patients with complete medical record and radiographic imaging were included in this study. The area of infarction was determined by the ABC/2 method and the degree of herniation was determined with Ambient cistern effacement and shift of the midline. The Glasgow Coma Scale score was assessed for neurologic status at admission, at operative time (in surgery group), and at one-week time after infarction. All patients were assessed with the modified Rankin Scale (RS) at discharge and at 3 months after infarction.

**Results:** The mortality rate of patients with malignant middle cerebral artery (MCA) infarction at discharge was 45% and 3 months after infarction was 48.8%. At discharge,

there was significant difference in mortality of patients with malignant middle cerebral artery (MCA) infarction in conservative group and surgery group [(17/50 (34%) versus 20/32 (62.5%)),  $p = 0.011$ ]. Also at 3 months after infarction, there was significant difference in mortality in conservative group and surgery group [19/50 (38.0%) versus 21/32 (65.6%)],  $p = 0.015$ ]. There was significant high mortality rate in surgery group which age  $\geq 60$ . Dyslipidemia and ischemic heart disease were risk factors of malignant middle cerebral artery (MCA) infarction related death with odd ratio 1.419 (95% CI 0.504-4.00) and 2.00 (95% CI 0.345-11.578) respectively.

**Conclusion:** The mortality rate of patients with malignant middle cerebral artery (MCA) infarction treated in our hospital was nearly 50% and the rest of patients were dependent. There was significant high mortality rate in surgery group with age  $\geq 60$  years which could be explained by the severity of disease. In addition, the more underlying diseases, an attribute to higher the more mortality.

### SELECTIVE LUMBAR NERVE ROOT BLOCK UNDER FLUOROSCOPE VS ULTRASOUND

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**Background and Objectives:** Particularly in lumbar radicular back pain, selective nerve root block (SNRB) is the accepted procedure both for diagnostic and therapeutic

pain management. This study was performed to determine the accuracy of needle-tip under ultrasound guidance subsequently confirmed with fluoroscopy in patients who underwent SNRB. To date, no studies have been performed in comparing these 2 techniques.

**Methods:** After the IRB approval, a prospective trial was conducted to determine the accuracy of ultrasound guidance SNRB in 40 consecutive patients with lumbar radicular pain undergoing fluoroscopic guidance SNRB from January 2010 to January 2011. Firstly, needle tip was located at the desired optimal landmark under ultrasound guidance and then subsequently fluoroscopic confirmation of needle-tip position was undergone. Finally, the injection was performed as usual. The primary outcome was the accuracy of needle-tip placement comparing between under ultrasound and subsequently fluoroscopic confirmation. The secondary outcome was the associated factors of the accuracy of needle-tip under ultrasound guidance. All patients who had been undergone these procedure did not receive analgesic medication.

**Results:** In addition, 78 lumbar nerve roots were injected in the patients who underwent SNRB under fluoroscopic guidance. The accuracy of needle-tip on each lumbar nerve roots under ultrasound guidance comparing with subsequently fluoroscopic confirmation ranged from 7.14%-80.95%. Mean of the accuracy of needle-tip under ultrasound guidance comparing with subsequently fluoroscopic confirmation was 62.82% while 95%CI ranged from 51.13-73.50. The age older than 65 years old was significantly associated with the poor accuracy under ultrasound guidance (P value = 0.0095). There was no significant difference of the accuracy of needle-tip with sex, BMI and spinal appearance. There is no serious adverse event in all patients periprocedurely and at follow-up.

**Conclusions:** To position the needle-tip under ultrasound guidance is feasible and has good safety profile. However; the accuracy could be achieved individually. Because of the accuracy of ultrasound guidance technique depends on the operator, steep learning curve and larger prospective clinical study is needed.

## OPERATIVE INTERVENTION FOR TRAUMATIC BRAIN INJURIES IN THE ELDERLY

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**Introduction:** The management of traumatic brain injuries (TBI) in the elderly (age  $\geq 65$  years) is a constant dilemma in neurosurgery. Advanced age is associated with poor clinical outcome as well as poor rehabilitation potential. The benefit of operative intervention in this group of patients is controversial. The aim of this study is to investigate for factors which may predict outcome of operative treatment in elderly patients with severe head injuries.

**Method:** A retrospective analysis was conducted on 68 elderly patients who had been operated on for TBI in a designated trauma center from 2006 to 2010. The impact of patients' age, pre-operative GCS, papillary responses, imaging findings, pre-existing medical conditions, and the use of anticoagulant/antiplatelet agents on patient outcomes were studied. Clinical outcome measures were hospital mortalities, GCS, and Glasgow Outcome Score (GOS) upon hospital discharge.

**Results:** The overall mortality rate was 55.9%. Old age, abnormal papillary response, low pre-operative GCS, the presence of midline shift and obliteration of cistern on CT were associated with poor survival. Upon further subgroup analysis, age was a prognostic factor but should not be a limiting factor for operation-patient aged 70 - 79 with normal bilateral papillary response still had a overall survival rate of 86.6% and good outcomes (GOS 4 or 5) in 53.3% of patients. Abnormal papillary response in at least one eye and pre-operative GCS  $< 13$  were associated with very poor prognosis. Pre-operative GCS was positively correlated with GCS upon discharge.

**Conclusion:** Elderly TBI patients with normal bilateral papillary responses and GCS  $\geq 13$  were found to have a good chance of achieving good functional survival after aggressive operative intervention. The latter should not be withheld based on patients' age alone.

## ORTHOPEDIC SURGERY

### UNIVERSAL EXTERNAL FIXATORS DEVICE

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**Background:** Surgical treatment of the varus knee deformity with degenerative change of the cartilage on the

medial side together with medial joint space narrowing is an indication if it fails after complete program of conservative treatment. There are many selective ways of surgery depend on severity of the degeneration, aging and activity of the patients. Osteotomy at the proximal tibia concomitance with valgus realignment to change loading from medial to lateral joint space is one of the treatments of choice. In the

past, many surgical techniques had been developed. The high tibial dome osteotomy was a one developed by Doctor Coventry and Doctor Maquet. This was quite a big operation and the old design external fixator had high worse impacted to many patients during the healing bone process. Nevertheless the long term outcome after surgery had high percentage of success rate.

**Objective:** To present a brand new invention of the first Thai universal fixators and the new development of minimal invasive surgical technique for high tibial osteotomy.

**Materials and Methods:** The new external fixators were invented and name universal fixators. It was a compact design to cope untoward of the old design and make more patient comfortable. After osteotomy at the proximal tibia, this instrument is used to external fix the bone by compressive force technique for about 6 weeks. When the

osteotomy bone was strong union. The entire instrument is removed out. Apart from this invention, the MIS technique was also developed. Surgical wound length was reduced from 7.5 cm. to 1.5 cm. Patients were allowed to walk in a day after surgery and only 3-4 days in hospital.

**Results:** The new invention implant was size smaller and friendly user to doctors and patients. The MIS surgical technique and operative timing still the same about only 20 minutes. Average healing time of the osteotomy bone was same about 6 weeks. The clinical result was reported in the year 2008. [Tienboon P, Atiprayoon S. Comparing dome high tibial osteotomy for patients more than sixty years old with patients less than sixty years old. *Asian Biomedicine* 2008; 2(5): 381-8.

**Conclusion:** The new invention and development of first Thai universal external fixators instrument for high tibial osteotomy and the MIS technique were reported.

## PLASTIC & RECONSTRUCTIVE SURGERY

### A RANDOMIZED CONTROLLED TRIAL COMPARING TOPICAL SKIN ADHESIVE WITH SKIN SUTURES IN THE PRIMARY REPAIR OF THE CLEFT LIP

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**Background:** Dermabond (2-Octyl Cyanoacrylate) topical skin adhesive represent an alternative adjunctive technique for skin closure. With the purported advantages over traditional skin sutures on cosmetic results, cost benefits and operative times, using of Dermabond in the primary cleft lip repair may improve post-operative wound cosmesis.

**Objective:** To compare the scar outcome of Dermabond topical skin adhesive and interrupted Dermalon 6/0 sutures among patients undergoing primary cleft lip repair.

**Materials and Methods:** The study prospectively enrolled and randomized 36 patients who underwent primary cleft lip repair to receive skin closure with Dermabond or Dermalon 6/0 sutures (n = 18 each). Outcome parameter was the scar outcome. The scar outcome was assessed by a blinded plastic surgeon using a clinical scar assessment score by visual analogue scale (VAS). The independent T-test was used to test for significance for the VAS assessment tool.

**Results:** There were no significant differences in the scar outcome between the two groups. The overall mean VAS score for the patients using Dermabond and Dermalon

6/0 sutures was 9.22 (SD 2.53) and 9.06 (SD 1.66), respectively (P = 0.817).

**Conclusions:** The results of the primary cleft lip repair using Dermabond topical skin adhesive are equivalent to the cosmetic results of the primary cleft lip repair using Dermalon 6/0 sutures.

**Keywords:** cleft lip repair, topical skin adhesive, skin sutures, scar outcome

### UNSATURATED FATTY ACIDS AFFECT MESEN-<sup>o</sup>CHYMAL STEM CELL SECRETION OF ANGIOGENIC AND INFLAMMATORY MEDIATORS

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**Background:** The promise of mesenchymal stem cell (MSC) therapy to treat diabetes mellitus and diabetic complications has generated significant scientific and clinical interest. Ongoing clinical trials in progress are primarily focused on the ability of MSC to ameliorate tissue damage by secreting cytokines and growth factors that promote angiogenesis while reducing inflammation and fibrosis. However, critical to the development of MSC-based therapies for patients with type 2 diabetes is an

understanding of how their metabolic environment, which consists of high levels of glucose and fatty acids, impacts MSC biology.

**Purpose:** To determine whether unsaturated fatty acids alter MSC secretion of angiogenic and inflammatory mediators

**Methods:** Primary human MSC were exposed to elevated levels of either omega-6 polyunsaturated fatty acids (linoleic acid and arachidonic acid) or monounsaturated fatty acids (oleic acid) for seven days in the presence of either normal or high glucose. Outcomes measured included MSC proliferation, gene expression and protein secretion. MSC proliferation was measured by both counting viable cells and quantifying BrdU incorporation during DNA synthesis. MSC gene expression was assessed using relative quantitative real time PCR and protein secretion was assessed using ELISAs.

**Results:** Exposure to unsaturated fatty acids inhibited human MSC proliferation. MSC expression and secretion of growth factors and cytokines was also altered after exposure to unsaturated fatty acids. Linoleic acid up-regulated MSC expression and secretion of VEGF, IL-11, IL-6 and IL-8; arachidonic acid elicited similar effects. In contrast, oleic acid had no significant effect on VEGF and IL-8 mRNA and secreted protein levels.

**Conclusion:** Collectively, these data suggest that perturbations in the metabolic environment may influence MSC regulation of cellular responses to injury. Furthermore, these data support the need for in vitro and in vivo studies to define the functional consequences of an altered MSC secretome. This work is directly relevant for the development of MSC therapy targeting the pancreas and diabetic complications including cardiovascular disease, nephropathy and chronic non-healing wounds.

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#### PHASE I CLINICAL EVALUATION OF PORE SKIN: A HUMAN DERMAL SUBSTITUTE

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**Introduction:** Extensive full-thickness wound is a major challenge. It needs to be grafted and often faces with limit donor site problem. Dermal substitutes are among the tissue engineered products applied to clinical use. There are a lot of commercial dermal substitute products now available. Besides their effectiveness, all of them are very expensive. PoreSkin, manufactured by faculty of medicine Chulalongkorn university, is the first human dermal

substitute developed in Thailand. It is a permanent dermal substitute aiming to reduce contracture. Donated human skin tissue is aseptically processed using technique to remove the epidermis and cells that can lead to tissue rejection and graft failure. The result is an acellular dermal template of natural biological components that acts as a dermal scaffold. The objective of this study is to assess the safety and ability in achieving durable and cosmetic definitive coverage of PoreSkin.

**Method:** Eleven hypertrophic burn scars were enrolled in prospective study. Scar excision and grafting with Pore Skin were performed 11 times in six patients. After scar excision, human dermal substitute (PoreSkin) combined with nanocrystalline silver dressing (Acticoat®) and negative pressure wound therapy (NPWT) followed by delayed split thickness skin grafting were performed.

The primary outcome assessed by the success of PoreSkin grafting or percentage of its take and the success of skin grafting or percentage of autograft take, complications, reaction and pain. The secondary outcome assessed by their durable and cosmetic properties.

**Results:** Engraftment rates of PoreSkin and autograft are 99.1 % and 91.8 % at day 5 follow by 97.7% and 87.3% at day 14. One wound required partial PoreSkin debridement due to infection. Two wounds required repeat autograft. All patients' pain scores are less than 5. Vancouver scar scales are all improved although without statistically significant ( $p < 0.05$ ). No major complications or rejection are observed.

**Conclusion:** The major finding in this phase I clinical study is that the performance of PoreSkin as a dermal substitute is comparable to other commercial dermal substitutes in term of engraftment rate, complications and rejection. Infection is a major problem using PoreSkin as same as other dermal substitutes.

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#### THE EFFICACY OF SMART PORTABLE NEGATIVE PRESSURE DEVICE: A PRELIMINARY STUDY

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**Background:** The benefits of negative pressure therapy (NPT) in wound bed preparation and skin graft fixation are well accepted in many wound care centers. But the cost of the treatment and the immobility of the patients are the disadvantages of the system. The authors have tried to find a small, portable, not expensive suction device for the NPT and innovate the Smart Portable Negative Pressure



Device (SPNPD) for the NPT.

**Objective:** To evaluate the efficacy of the SPNPD in skin graft fixation.

**Method:** The SPNPD was innovated by selection of the pump, battery and pressure regulator. All the part were assembled together. The device was tested for the safety and accuracy before clinical usage by Biomedical instrument department, Faculty of Medicine Siriraj Hospital. The device was used on skin graft fixation in 4 patients. The grafted areas were inspected at 5 and 7 days for graft survival.

**Result:** The device worked flawlessly. Average percentage of graft survival was 96.25%. All of the patients were satisfied with the device because they could mobilize out of the beds.

**Conclusion:** SPNPD was effective for skin graft fixation and could be used as conventional negative pressure therapy.

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#### AN INNOVATIVE INSTRUMENT FOR SEMI-OPEN RELEASE OF A1 PULLEY: A CADAVERIC STUDY

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**Background:** Stenosing tenosynovitis or tenovaginitis of the thumb or fingers is one of the most common causes of hand pain and disability. It is commonly called trigger thumb or trigger finger (TF). It is caused by a mismatch between the size of the flexor tendon and the first annular pulley (A1 pulley), most often when the tendon develops a nodule (knot) or swelling in its lining. The tendon swells, it must squeeze through the opening of the sheath, which causes pain, popping, or a catching feeling in the finger or thumb. Now conservative treatments do not provide relief of the symptom. The goal standard for treatment of TF is surgical release of the A1 pulley. Open. Although the success rate of open surgical release is almost 100% but complications have been described such as digital nerve injury, infection, joint stiffness, weakness, scar tenderness and bowstringing of the flexor tendon. Recent clinical results indicate that percutaneous A1 pulley release is safe and effective. Several methods using various instruments for percutaneous release have been reported with satisfactory results, but few complications such as incomplete release and flexor tendon damage have been described. To prevent such complications, an innovative instrument was designed for semi-open release of the A1 pulley.

**Materials & Methods:** Semi-open release of the A1 pulley was performed in 100 digits from 18 fresh-frozen

cadaver hands using an innovative instrument. The instrument was made from a Steimann pin, 3 mm. in diameters. The 2 tip ends were blunt and a sharp knife was made between them. A tiny incision was made about 0.5 cm. proximal to the A1 pulley. The instrument was inserted so that the longer tip end was just under the A1 pulley before the A1 pulley was completely cut while the instrument was moving horizontally forward. There were 12 men and 6 women. Ages ranged from 35-81 years with mean age of 53.2 years. The exclusion criterion are previous history of hand surgery or trauma and age under 20. The result, including completeness of the A1 pulley release, injury to the A2 pulley, flexor tendon damage, laceration of the neurovascular structures, age, and operating time are reported.

**Results:** A1 pulley was completely released in 93 digits and incompletely released in 7 digits. Injuries to neither the flexor tendons nor digital nerves were not identified. The success rate was 97%. The mean operating time on each digit was 2.5 minutes in thumb, 1.8 minutes in index finger, 2.1 minutes in middle finger, 1.9 minutes in ring finger and 2.4 minutes in little finger.

**Conclusion:** A new innovative instrument is more effectively releasing of A1 pulley. There are no injuries to flexor tendon and neurovascular nearby structure in this study. It can be quickly, effectively and safely performed. The incomplete release are more likely due to quality of cadaver and the learning curve. It is concluded that semi-open release with this instrument can be successfully applied in the clinical practice.

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#### SMART NEUROSURGICAL PROBE, ROBOTIC SYSTEM AND SENSORS INTEGRATION FOR COMPUTER ASSISTED NEUROSURGERY

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**Background:** The flexible and steerable probe presented in this study has been developed at Imperial College London. The integration of the flexible probe prototype into a robotic system is part of the development for robotic assisted minimally invasive neurosurgery in the context of the European FP7 ROBOCAST (ROBOT and sensors integration for Computer Assisted Surgery and Therapy).

**Objectives:** The goal of the project is to provide a robotic system for assistance in keyhole neurosurgery for in vitro experimentation in the operating room (OR) by employing the steerable neurosurgical probe, an intelligent autonomous trajectory planner, a high level controller, advance robotic system and a set of field sensors.

**Materials & Methods:** An attached picture shows a view of the integrated components of the ROBOCAST system. A 6-axis serial gross positioning robot (1) is used to support a miniature parallel robot (2) holding the steerable probe (3) to be introduced through a keyhole opening in a skull model (4). An electromagnetic tracking system (5) is used to control the position and orientation of the steerable probe tip, while an optical tracking system (6) monitors the robot and skull position. A flexible two-part probe (length = 200mm, outer diameter = 12 mm) was pushed from the base by a cable-link actuator into a brain-like phantom made from gelatine to reach a target.

**Results:** Preoperative diagnostic images showing the location of the deep brain target are processed by the high level controller, which supplies the path of minimum risk trajectory based on digital brain segmentation. The controller generates the motion signals required to actuate the flexible probe. An electromagnetic position sensor, embedded at the tip of the flexible probe, provides the position feedback to control probe motion. The novel steerable probe has been demonstrated to achieve curvilinear trajectories to reach a target. The prototype has been found to produce a targeting accuracy of approximately  $0.68 \text{ mm} \pm 1.45 \text{ mm}$ .

**Conclusions:** This project is addressed by integrating existing and novel medical technology in the fields of medical robotics, surgical planning and real time monitoring into a next-generation steerable neurosurgical probe.

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## PROSPECTIVE STUDY ON THE TREATMENT OF HYPERPIGMENTED SKIN GRAFT BY INTENSE PULSED LIGHT

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**Background and Objectives:** Skin graft hyperpigmentation is a common phenomenon among Asian. This condition is difficult to treat and can cause severe psychological distress. Intense pulsed light (IPL) has been used to treat pigmented lesions with promising result. The role of IPL in treating skin graft hyperpigmentation has not been explored. The purpose of this study was to assess the efficacy and complication of IPL in the treatment of skin

graft hyperpigmentation.

**Materials and Methods:** 18 patients with Skin graft hyperpigmentation were treated by IPL. There were 10 females and 8 males. Their age ranged from 21 to 70 years with a mean age of 49.6 years. The cutoff filters of 590 nm were used for 3 treatments at intervals of 3-4 weeks. Patients were treated with an energy fluence of 20-28 J/cm<sup>2</sup>, pulse width of 2-4 milliseconds, double pulse mode, and a delay of 15-40 milliseconds. The degree of pigmentation (melanin index) was objectively recorded with a Derma Spectrometer. Subjective assessment was made by two blinded, nontreating physicians.

**Results:** 11% of patients showed marked clinical improvement, 50% did moderate improvement, and 28% did slight improvement. The melanin index ( $37.56 \pm 2.99$ ) decreased after the treatment comparing before the treatment ( $40.67 \pm 2.70$ ), which shows a significant difference ( $P < 0.001$ ). 6 patients developed blisters and 3 patient had erythema that all resolved within 1 week without leaving permanent marks.

**Conclusions:** IPL is effective and safe in treating skin graft hyperpigmentation. Adverse reactions were minimal and self-limited.

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## EVALUATION OF WOUND HEALING ACTIVITY OF LAWSONIA INERMIS LINN GPO PREPARATION IN RAT MODEL

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Extraction leaves of *Lawsonia inermis* Linn can promote wound healing activity, enhance wound contraction, enhance tensile strength and increase hydroxyproline content. It can be used as a wound healing agent. *Lawsonia inermis* Linn Extract and *Lawsonia inermis* Linn GPO preparation was evaluated for wound healing potential in rat model.

Fresh henna leaves (*Lawsonia inermis* Linn) were collected and blended with 16% ethanol after that extract of *Lawsonia inermis* Linn was filtered. The filtrate was used for the experiment. The preparation was the extract of *Lawsonia inermis* Linn add with GPO formulation in ratio

1:9. The wound healing activity was assessed by measuring the wound area and recording the day of complete epithelialization. The wound was also subjected to histopathological studies to examine the microscopic changes.

The result reveals that the animal in group V; treated with *Lawsonia inermis* Linn preparation has showed a significant relation reduction in wound area (88%, 96%) when compared to a control group (77%, 87%) and a standard group; treated with silver sulfadiazine (82%, 92%), and treated with hydrogel (72%, 89%). The rate of epithelialization is the animal in group IV (*Lawsonia inermis* Linn.

Extract) and group V (*Lawsonia inermis* Linn GPO Preparation) has showed faster rate of epithelialization (Mean  $\pm$  SD, days:  $12.2 \pm 0.44$ ,  $12.0 \pm 0.70$  respectively) than group III (hydrogel) and a control group. It has showed equivalent rate of epithelialization compared to group II (Mean  $\pm$  SD, days:  $12.20 \pm 0.44$ ). Histopathological studies also supported the wound healing in group IV and group V, tissue obtained from the 20<sup>th</sup> day which has showed more fibroblast and collagen and few inflammatory cells when compared to a control and a standard group. Thus this study can conclude the use of *Lawsonia inermis* Linn GPO preparation as a wound healing agent.

## SURGICAL EDUCATION

### SURGICAL EDUCATION AND TRAINING IN THE UNITED KINGDOM

*John P Collins*

United Kingdom

Major changes have taken place in postgraduate surgical education and training in the United Kingdom over the past ten years. This reform has been driven by multiple societal, political, regulatory, professional and educational factors.

The four surgical colleges in the UK and Ireland responded to these factors by initiating the UK Surgical Curriculum Project. Working with the nine surgical specialties, a new curriculum framework has been developed including standards, national regulatory systems, web-based educational resources and clear processes for teaching and learning. Each specialty has developed a new curriculum around generic and specialty based knowledge, technical skills and judgement and have agreed on the professional skills generic to all specialties. This has resulted in the Intercollegiate Surgical Curriculum Programme (ISCP) which now forms the basis for surgical training across the nine surgical specialties.

Surgical education and training is divided into core and specialty training with separate selection required for each component. Selection is nationally organised and locally administered with all eligible applicants being interviewed. The level of previous experience required for selection and the failure of large numbers of satisfactory core trainees to progress to specialty training remains controversial. Several courses are provided some of which are mandatory. Simulation to enhance learning is slowly gaining traction with each specialty working to identify

aspects of their curriculum where simulation can assist in the acquisition of various competencies. Research requirements during training vary between the specialties.

Formative assessment and feedback is based on the trainee's learning portfolio which includes their learning agreement at the commence of each rotation, a record of their training and the outcome of workplace-based assessments and although the latter remain a challenge to implement. Progress each year depends on the outcome of an external annual review of competence progression (ARCP). Summative assessment includes formal Membership and Fellowship examinations and completion of training is recognised by a Certificate of Completion of Training (CCT). The majority of trainees undertake further training before applying for a consultant post.

Concerns about the number of medical graduates commencing surgical training but with little hope of becoming surgeons, the impact of reduced working hours and the challenges relating to implementing workplace-based assessments remain the focus of ongoing discussions.

### IMPROVING SURGICAL EDUCATION AND TRAINING

*John P Collins*

United Kingdom

The hallmarks of a successful surgical education and training program include clearly defined outcomes, the development and delivery of high quality programs, access to an accredited learning environment, the availability of an equipped motivated and sustainable faculty, exposure of the trainee to high quality care and the recruitment and selection of trainees with the right attributes to be successful

surgeons as well as meeting societal workforce needs. The broad roles of a surgeon must be identified and a program developed to prepare trainees for these roles. Attempts have been made to identify competencies which underpin each of these roles and some programs base their selection, education and assessment around these competencies - the so called competency-based training. However the surgeon's overall role is complex and medical education can only be partially conceptualised on obtaining competencies. The concept of competent professional practice where observed performance is more than the sum of the set of competencies used remains important. Improvements of a program must focus on the development and circulation of clear curriculum content, on methods to improve its delivery to help learning and on ensuring assessment is aligned to the curriculum. Simulation, e-learning and other forms of technology-enhanced learning must be explored and those selected should be appropriate for the local environment.

Trainees work in a broad range of clinical environments and geographical locations each of which must be undergo regular accreditation to ensure they provide an adequate volume and suitable case-mix of patients, a positive training culture and a suitable environment for learning. Appropriate processes and criteria must be developed to undertake such accreditation. Exposure of trainees to high quality patient care with appropriate supervision and graduated responsibility will ensure that safety and quality considerations become an integral focus of their professional lives.

Without an equipped and motivated faculty no training will take place. Sustaining this vital resource involves ongoing recruitment, equipping them for the different

educational roles involved and the provision of appropriate recognition and support.

In order to attract and select high quality medical graduates for surgical training, greater efforts must be made to sow and foster the seeds of a possible surgical career during medical school followed by a commitment to merit-based selection. The processes and methods used for selection must be transparent and defensible.

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### DELIVERING SURGICAL EDUCATION IN THE DIGITAL AGE - A NEW PARADIGM?

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*David Tolley*

President, Royal College of Surgeons of Edinburgh

The birth of the net generation (generation Z) at the dawn of the worldwide web in the early 1990s, has spawned a highly connected group of individuals who are dependent on communication and media technologies. These 'digital natives' demand instant access to social networking, the internet and instant messaging through smart phone technology. Their approach to knowledge acquisition differs significantly from previous generations and their reliance on digital technology offers new opportunities for surgical training and assessment. These approaches are explored during the presentation which also looks at the potential for global interaction through, for example, the award winning Edinburgh Surgical Sciences Qualification which has developed as a result of a partnership between the University of Edinburgh and the Royal College of Surgeons of Edinburgh.

## SKIN AND SOFT TISSUE

### GENE EXPRESSION PROFILES AND FUNCTIONAL GENOMICS IN DERMAL FIBROBLASTS FROM DEEP CONE/FAT DOME OF THE DUROC PORCINE MODEL OF FIBROPROLIFERATIVE SCARRING

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**Background:** Hypertrophic scarring is a major devastating problem after burn injury and the molecular etiology of this process remains unknown. Fibroblasts thought to play a key role in the fibroproliferative scarring

and the role of fibroblast derived from dermal cone/fat dome has not been studied.

**Materials and Methods:** We analyzed the genome-wide patterns of gene expression in fibroblasts isolated from deep cone/fat dome, in shallow and deep partial-thickness wounds using Duroc porcine model. GoMiner and Ingenuity Pathway Analysis were used to determine the transcriptome and functional genomic.

**Results:** Our Analyses identified BMP4 (Bone Morphogenetic Protein 4), IGF1R (Insulin-like Growth Factor 1 Receptor), IGFBP5 (Insulin-like Growth Factor Binding Protein 5), THBS1 (Thrombospondin1) and AGT (Angiotensinogen) as the candidate genes that need to be explored further. Through literature mining using

Gene Ontology and Ingenuity Knowledge Base, these candidate genes showed mainly associated with extracellular matrix, cell proliferation, cell migration, angiogenesis, tumorigenesis and rheumatoid arthritis.

**Conclusions and Significance:** While the pathogenesis of fibroproliferative scarring remains poorly understood, the use of comparative gene expression arrays may prove

helpful in identifying the interactions between endogenous fibroblasts and the surrounding cellular players and a potential remodeling pathway for hypertrophic scarring. Understanding this complex interplay is important to provide a basis for systems biology of cutaneous fibroproliferation and formulating an effective therapeutic strategy of hypertrophic scarring.

## SURGICAL ONCOLOGY

### THE MOST PREVENTABLE & CURABLE CHRONIC DISEASE

*LaMar McGinnis, Jr.*

Lee Jong-wook, director general of the World Health Organization, has stated that noncommunicable diseases are now the #1 cause of death globally and have the largest economic impact on their countries of all health problems. Together, the NCD's cause 35 million deaths/yr. and are expected to increase by 17% over the next 5 years. The NCD's are diverse but mainly include heart disease, stroke, cancer, chronic respiratory disease and diabetes. Cancer has become the #1 cause of death and economic loss among the NCD's. It is estimated that 70% of these cancers could be prevented. This presentation will discuss the surgeons role and responsibility in combatting this looming worldwide pandemic, predicted to cause 17 million deaths/

yr. by 2030.

### SURGEONS AND CANCER - THE NEXT GENERATION

*LaMar McGinnis, Jr.*

Surgery has historically been the most successful treatment for early stage solid tumors. Cancer has become the #1 cause of death globally as populations expand and age and lifestyles change. A global pandemic of cancer is predicted. Our scientific understanding of the basic biology of this most feared malady is exploding along with exciting progress in pharmacogenetics and always advancing technology. What will/should be the role of surgeons/surgical oncologists/interventional biologists in the 21st century?

## TRANSPLANTATION SURGERY

### QUALITY OF LIFE IN LIVER TRANSPLANTATION IN SIRIRAJ HOSPITAL

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**Background:** Liver transplantation is a treatment of choice in end-stage liver disease. It gives a chance to get back to an active and prolonged life. Recently, more attention is being paid to health related quality of Life

(HRQoL) of patients and their spouse or caregivers after liver transplantation. The aim of the study was to analyze patients and their spouse or caregivers HRQoL between pre-transplant and post-transplant groups, using generic and disease specific health questionnaire.

**Methods:** The study was conducted in Siriraj organ transplant unit, Faculty of Medicine Siriraj Hospital, Mahidol University between October 2010 and January 2011. The Short Form-36 (SF-36) and Chronic Liver Disease Questionnaire (CLDQ) were used to evaluate the HRQoL of pre-transplant and post-transplant patients. The HRQoL scores of the patients and caregivers were analyzed and compared between two groups.

**Results:** The post-transplanted patients [N=50, mean

age 53 (23-76) years, male 72%, female 28%] and their spouse and caregivers demonstrated significant better generic SF-36 HRQoL scores ie. physical and social functioning, role limitation because of physical or emotional problems, bodily pain, vitality, and general and mental health than pre-transplanted patients [N = 42, mean age 55 (22-69) years, male 71%, female 21%]. Similarly, the post-transplanted group showed significant improved CLDQ scores in the part of fatigue, activity, abdominal symptoms, systemic symptoms and worry. In term of emotional function, there was insignificant different between two groups.

**Conclusions:** Liver transplantation improves HRQoL of end-stage liver patients and their spouse or caregivers. A prospective longitudinal study to assess long term HRQoL of the patients and their spouse or caregivers over time might be conducted to eliminate time-frame bias.

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#### CORRECTED TACROLIMUS LEVEL IN ORTHOTROPIC LIVER TRANSPLANT WITH ANEMIC PATIENT

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**Background:** Tacrolimus is known to be much more concentrated in red blood cell than in plasma. Current practice still uses tacrolimus whole blood level for monitoring. There has been no formulation to calculate the effect of hematocrit on reported whole blood level. This study was conducted to establish a simple, easy to use formula to calculate the effect of hematocrit on reported tacrolimus level.

**Material and Method:** Twenty six stable liver transplant recipients were recruited for the study. During routine follow up, blood sample was drawn for routine tacrolimus whole blood trough level. The studied blood sample was centrifuged and half of red blood cell was removed. The rest of the specimen was recombined and rechecked for whole blood trough level and hematocrit. Results are plotted and analyzed. A formula was developed.

**Result:** Whole blood tacrolimus trough level of 26 patients varied, ranging from 1.40 to 12.70 with mean of 5.52. After removal of part of red blood cell, tacrolimus level declined in every single specimen. The formula for correction of reported tacrolimus level in anemic patient to hematocrit of 40% derived from this study is as followed Corrected tacrolimus level =  $(0.6 \times \text{tacrolimus level}) + [0.6 \times \text{tacrolimus level} \times (40/\text{Hct})]$ .

**Conclusion:** Hematocrit level has significant effect on reported tacrolimus level. We have studied and developed a simple formula to convert reported tacrolimus level in anemic patient back to level as if it would be if patients' hematocrit was 40%. With this formula, better dose adjustment can be accomplished with less side effects. Further studies are required to validate this formula and its clinical significance.

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#### MANAGEMENT OF BRAIN DEATH PATIENTS AT LERDSIN HOSPITAL: 33 CASES ANALYSIS

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**Background:** Diagnosis of brain death and appropriate treatment are involved with medicolegal issue that determine death for the heart beating patients. Nowadays, medical standard show us that brain dead patients are the dead persons who are eligible for organ donation. As well as in Thailand, management of brain death which certified by Thai Medical Council related to ethical principle and is still not the discipline of law. Hence, most cases of brain dead patients are neglected diagnosis and lose an opportunity for organs donation. However, the authors need to study this topic in order to inform the benefit of brain death diagnosis and organ donation.

**Objectives:**

1. To evaluate and study for appropriate technique to confirm brain death by apnea test.
2. To study for attitude of patient relatives about organ donation.
3. To study for appropriate management for brain dead patients.

**Materials and Methods:** The study method is retrospective review in potential brain dead patients that may be eligible for organ donation at Lerdsin hospital during 2006-2010. All patients were managed under recommendation by organ donation center of Thai Red Cross. Documentation of patients such as sex, age, diagnosis, blood pressure, temperature, presentation of diabetes mellitus, inotropic drug administration, time to apnea test, time to disconnection of ventilator during apnea test, level of PaCO<sub>2</sub> and PaO<sub>2</sub> were analyzed. After the brain death diagnosis was confirmed by apnea test. The patient's relatives were informed about the opportunity for organ donation and the organ donation process was done.

**Results:** There were 33 patients (12 female and 21 male). 15 cases were traumatic brain injury, 14 cases were spontaneous hemorrhage and 4 cases were brain tumor. Polyurea was found 26 cases. There were all neurogenic

shock. Average time from apnea to apnea test was 18 hours (6-72 hours). Average time of ventilation disconnection was 16.5 minutes (8-30 minutes). All cases significantly passed apnea test without hypoxia. 23 cases (69.69%) accepted to donate organ and 21 cases success to organ harvest.

**Conclusions:** Common problem in the potential donor patients are polyuria, diabetic insipidous and

hypotension. Adequate fluid resuscitation and inotropic medication are the keys of success. After adequate resuscitation was done. Systolic blood pressure is more than 80 mmHg while no evidence of brain stem sign, brain death diagnosis will be performed immediately as guideline. Then organ coordinator informs the patient's relatives and the success rate for organ donation was 69.69%.

## UPPER GASTROINTESTINAL SURGERY

### LAPAROSCOPIC CRURAL REPAIR AND NISSEN FUNDOPLICATION IN A CASE OF PARAESOPHAGEAL TYPE III WITH REFLUX ESOPHAGITIS

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**Background:** Patients with paraesophageal hernia are usually symptomatic with gastroesophageal reflux disease dysphagia, chronic epigastric pain. The authors present a laparoscopic crural repair without mesh for repair of paraesophageal hernia. Combined with laparoscopic Nissen fundoplication is an antireflux procedure for correction of reflux esophagitis.

**Method:** A 67 years old female present with chronic epigastric discomfort and heartburn. The patient preoperative evaluation include barium esophagogram and esophagogastroscope that shown paraesophageal type III with reflux esophagitis. Laparoscopic repair include reduction of hernia contents, removal of the hernia sac, closure of the hiatal defect, and an antireflux procedure. Crural repair and Nissen fundoplication were done by laparoscopic simple suture technique with prolene 2-0.

**Result:** Operative time was 3 hours and postoperative period was uneventful. The patient was recovery from symptom of dyspepsia and heartburn. A barium esophagogram was performing at 6 month and 1 year after operation. No recurrent of paraesophageal was detect from imaging study.

**Conclusion:** Laparoscopic repair of paraesophageal is associated with improved long-term symptom relief, low morbidity. A crural repair without mesh is safe and no recurrent of paraesophageal hernia after 1 year of follow up period.

### HYPERThERMIC INTRAPERITONEAL CHEMOPERFUSION (HIPEC) FOR GASTRIC CANCER WITH CARCINOMATOSIS: SIRIRAJ EARLY EXPERIENCES

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Gastric cancer with carcinomatosis is fatal condition with the patients' survival of only a few months. Surgery is not possible and chemotherapy is usually not effective. Total peritonectomy with hyperthermic intraperitoneal chemoperfusion (HIPEC) is thought to be the only way to combat this condition but due to its high morbidity, its application is still limited in a few specialized centers.

We report two cases of gastric cancer with carcinomatosis, treated with HIPEC. The patients were in relative young age group (age 42 and 47 years), with multiple nodules diagnosed seen during diagnostic laparoscopy. Both patients had no nodules in the area of visceral peritoneum and no gross tumor was left after the operation. Total gastrectomy with splenectomy with distal pancreatectomy with cholecystectomy and total peritonectomy was done in both patients (in one patient hysterectomy and bilateral salpingo-oophorectomy was added due to Krukenberg tumor). After completion of the organs and peritoneum, extensive lavage of the abdominal cavity was done with warm saline (10 liters) followed by hyperthermia of the abdomen with ciplastin 70mg/kg. bodyweight. Then anastomosis was done and the abdomen closed.

The operation time was 400 and 530 minutes respectively and blood loss was 710 ml. Hospital stay was prolonged (30 days, mean hospital stay) but no serious

complication occurred. The patients did well while receiving post-operative chemotherapy with no ascites detected.

HIPEC is effective in treating gastric cancer with carcinomatosis with minimal postoperative complication. It should be included in the option for the treatment of gastric cancer.

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### RESULTS OF COMBINED ORGAN RESECTION FOR LOCALLY ADVANCED GASTRIC CANCER IN SIRIRAJ HOSPITAL

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**Background:** Gastric cancer is one of the leading causes of cancer death worldwide. Most of the patient in Thailand presented with locally-advanced or advanced disease that needed extensive surgery.

**Objectives:** Gastrectomy with systematic lymphadenectomy is the standard treatment for gastric cancer. En bloc tumor removal combined with adjacent organ resection is said to be an extensive surgery for locally advanced gastric cancer which can cure the patient but it is associated with high morbidity and mortality. Therefore, the results and outcomes of this aggressive treatment were analysed.

**Materials & Methods:** The study was retrospectively analysed from the medical records of patients who underwent gastrectomy with D2 lymphadenectomy combined with adjacent organ resection at the Department of Surgery, Siriraj Hospital between October 2004 and March 2011. Combined organ resection was defined as the standard gastrectomy with lymphadenectomy combined with the removal of organ or part of organ that suspected to be involved by gastric cancer.

**Results:** There were 20 patients who underwent combined organ resection. The mean age was 58.55 years (range: 36-92) and there were 10 females and 10 males. Three patients were stage II gastric cancer, 15 patients were stage III, and 2 patients were stage IV. Three patients had positive peritoneal cytology. Three patients underwent subtotal gastrectomy and 17 patients underwent total gastrectomy. D2 lymphadenectomy was performed in all patients. Five patients underwent combined distal esophageal resection, 9 patients with distal pancreatectomy, 6 patients with colectomy, 2 patients with liver resection, 2 patients with pancreaticoduodenectomy, and 2 patients with peritonectomy with hyperthermic intraperitoneal

chemotherapy. One patient had positive malignant cell at proximal resection margin and one patient had positive distal resection margin. Mean length of hospital stay was 19 days (range: 11-38), mean operative time was 319.5 minutes (range: 150-530), mean estimated blood loss was 750.4 mL (range: 200-3100). Six patients had postoperative complication, 1 patients had pneumonia, 2 patient had pleural effusion, 1 patient had wound dehiscence, 1 patient had minute leakage from esophagojejunostomy anastomosis, 1 patient had pancreatic fistula, all of them were improved with conservative treatment. Ten of fifteen (66.67%) patients survived more than 1 year after surgery.

**Conclusions:** Combined organ resection for locally advanced gastric cancer had equivalent early postoperative outcomes compared with standard surgical resection. Postoperative complication was minimal and 1-year survival was acceptable.

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### HISTOPATHOLOGIC RESPONSE AFTER NEOADJUVANT CHEMORADIATION FOR LOCALIZED ESOPHAGEAL CANCER

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**Background:** Esophageal cancer who were treated with neoadjuvant chemoradiation, there are unclear about what is the predictor for outcome after neoadjuvant therapy and survival outcome.

**Objective:** To assess responsiveness of the neoadjuvant chemoradiation for localized esophageal cancer in term of pathologic results, and survival

**Methods:** Thirty-nine patients with localized esophageal cancer who received neoadjuvant chemoradiation therapy and followed by esophagectomy. Responsiveness were assessed for residual carcinoma. Clinicopathological features, residual carcinoma status and pretherapy stage and posttherapy were compared.

**Result:** A histopathological response to neoadjuvant was correlated significantly with complete tumor resection status. Complete pathological response in 51.4%. Minor pathologic response was present in 14.4%. The pathological response was significantly correlated to 2-year survival rate at level 10% ( $P = 0.8$ ). Level of dose of radiotherapy were not significantly correlated with tumor response ( $p = 0.921$ ) and survival at 2 year ( $p = 0.697$ )

**Conclusion:** Histopathological response were significantly correlated to tumor resection and survival outcome.



## TRAUMA, BURN, CRITICAL CARE

### PROGNOSTIC VALUE OF BLOOD LACTATE MONITORING IN CRITICALLY ILL TRAUMA PATIENTS: HELP OR HYPE?

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**Background:** The quest for the ideal endpoint of resuscitation after severe trauma is still unresolved. Elevations in blood lactate level and the failure to normalize such elevations have been shown to predict a poor outcome in critically ill patients. Although many guidelines and protocols, i.e. Advanced Trauma Life Support (ATLS)<sup>®</sup> strongly advocate the use of blood lactate level, others, including some textbooks such as the Sabiston Textbook of Surgery feel the evidence is as yet inconclusive. There is a sparsity of published data concerning the use in critically ill trauma patients.

**Objectives:** To examine the prognostic value of the first and repeated blood lactate level assays during shock resuscitation after intensive care unit (ICU) admission in trauma patients.

**Materials and Methods:** All trauma ICU patients admitted to Songklanagarind Hospital during August 2009 to July 2010 who met the inclusion criteria of the standardized shock resuscitation protocol were reviewed. The protocol was an early goal-directed process with the goal of attaining an oxygen delivery index (DO<sub>2</sub>I) >500 mL/min/m<sup>2</sup> and/or to reduce blood lactate to <2.5 mmol/L within 24 hrs. The protocol inclusion criteria were one or more of: (i) massive transfusion (>10 units PRCs in 24 hrs); (ii) major abdominal trauma (abdominal AIS >3); (iii) severe pelvic fracture requiring transfusion > 6 units; (iv) vasopressor need after resuscitation in the operating room; and (v) progressive lactic acidemia. Blood lactate levels were measured at admission and every 8 hrs for the first 24 hrs of admission. Patient demographics, hemodynamic parameters, injury severity scores (ISS), transfusion requirements, and survival outcomes were recorded. Receiver operating characteristic (ROC) curves for mortality were constructed with corresponding areas under the ROC values (AUC) to evaluate the prognostic values of blood lactate levels on admission (T<sub>0</sub>), at 8 hr (T<sub>8</sub>), 16 hr (T<sub>16</sub>),

24 hr (T<sub>24</sub>).

**Results:** There were 128 patients (average age 34 + 16 years, 81% male, 79% blunt trauma injury, ISS 26 + 11) who met the study criteria admitted during the 1-year study period. Reduction of lactate within the first 24 hrs was associated with an improved survival rate, as seventy-eight of 85 patients (92%) whose lactate level normalized in 24 hrs survived, while only 22 of the 43 patients (51%) who did not clear their lactate level to normal by 24 hrs survived ( $p < 0.001$ ) (Figure 1). The blood lactate levels had a high mortality predictive value and the prognostic value on the serial monitoring during the first 24 hrs was well preserved (T<sub>0</sub>AUC = 0.76, T<sub>8</sub>AUC = 0.83, T<sub>16</sub>AUC = 0.77, T<sub>24</sub>AUC = 0.81) (Figure 2)

**Conclusion:** Lactate clearance within the first 24 hrs of ICU resuscitation was associated in our study with improved outcome in trauma patients thus confirming prognostic importance of serial blood lactate monitoring during this critical period.

### ANATOMICAL STUDY OF INTERNAL ILIAC VEIN IN SOFT CADAVERS

**Introduction:** Anatomy of internal iliac vein is variable which could be problematic while performing aggressive pelvic dissection. Although several types of variation have been reported, classification of these variations has not been well established. The aim of this study was to report the classification of the internal iliac vein variation and to report new venous branches in the pelvic venous system discovered during dissection.

**Material and Methods:** Anatomical dissection of internal iliac vein was performed in 20 soft cadavers, 10 male and 10 female. The anatomy of internal iliac vein was classified into normal anatomy and anatomical variation. Normal anatomy was defined when there was one main trunk of internal iliac vein, which compose of anterior division (obturator vein, inferior gluteal vein, internal pudendal vein, middle rectal vein) and posterior division (superior gluteal and lateral sacral vein). The internal iliac vein deviated from the normal pattern was classified into anatomical variation.

**Results:** Normal anatomy of internal iliac vein was found in 11 cadavers (55%). The internal iliac vein deviated from the normal pattern discovered in this study including

two main trunks of internal iliac vein pattern and middle sacral trunk pattern. Two main trunks pattern was found in 8 cadavers (40%) while the middle sacral trunk pattern was found in one cadaver (5%). In addition, new pelvic vein branches including pelvic side wall tributary and S1 tributary were found in all cadavers.

**Conclusion:** The variation of internal iliac vein is common. The classification of variation established in this study may be helpful for surgeons while performing aggressive pelvic dissection. Further study is warranted.

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### FRONTIERS IN PREHOSPITAL CARE IN EARLY RESUSCITATION

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*David B. Hoyt, MD, FACS*

Executive Director, American College of Surgeons, Chicago, Illinois, USA

Prehospital care is rapidly evolving due to prospective randomized trials now possible with funding from the National Institutes of Health and the Department of Defense in the U.S. The greatest areas for consideration involve early airway management, fluid resuscitation, and early management of head injury. The effects of hypoxia and hypoventilation on head injury have led to interest in early airway management, including rapid sequence intubation. Recent data suggests despite the potential advantages, that early airway management, including intubation, can have unintended consequences if protocols do not correct for excessive ventilation. The results of airway management and recent trials will be reviewed.

The other major prehospital resuscitation strategies involve fluid management. The status of hypotensive resuscitation, use of alternative crystalloid resuscitation with hypertonic saline, oxygen-carrying solutions (blood substitutes), and other adjuvants for resuscitation are all currently being considered. The results of recent work on each of these will be reviewed to help inform the best strategy for early resuscitation.

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### NEW RESUSCITATION STRATEGY: DAMAGE CONTROL RESUSCITATION

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Repeated episodes of hypotension and organ hypoperfusion will lead to severe metabolic acidosis, coagulopathy, and hypothermia. Recently a new approach has been proposed in these circumstances. Damage control, in general, includes an abbreviated surgical procedure, temporary packing, and temporary closure of the chest or

abdomen. Damage control resuscitation refers to correction of the coagulopathy of trauma often seen in the damage control scenario.

Historically, resuscitation has involved incremental restoration of whole blood with component therapy based on studies originally from Viet Nam. More recent studies from Iraq have demonstrated that early use of whole blood or early reconstitution of whole blood, in principle (1:1 resuscitation), is associated with decreased mortality. Similar retrospective studies in civilian trauma have suggested the importance of this strategy. Concerns regarding crystalloid resuscitation have also contributed to support for damage control resuscitation. A recent survey of trauma centers in the United States and Europe showed protocols regarding damage control resuscitation are inconsistent and still often target restoration of fresh frozen plasma and platelets inconsistently. A prospective randomized trial is under consideration by the FDA to establish the optimal ratio of resuscitation. The history of this discussion and current protocols and controversies will be reviewed.

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### ATLS EVIDENCE AND EVALUATION

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*J B Kortbeek, MD FRCSC FACS*

The Advanced Trauma Life Support Course was developed in Nebraska in 1978 and introduced by the American College of Surgeons Committee on Trauma in 1980. It has been widely adopted and currently is taught in over 60 countries. More than one million doctors have taken the course. Organized trauma care is associated with decreases in mortality and morbidity. Standardized trauma education of doctors and other health care providers is a required to meet trauma system verification standards. Medical education has evolved from principles introduced by Halsted.

Current and future trends in ATLS instruction are based on evidence supporting changes in medical education. Curricula and teaching methods will continue to evolve as advances in both technology and in understanding the science of education accelerate.

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### POST INJURY MULTIPLE ORGAN FAILURE IN A UNIVERSITY HOSPITAL IN THAILAND

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*Thitipat Wattanakul, Rattaplee Pak-art*

**Background:** Multiple organ failure (MOF) is one of the common causes of late trauma death. There are only

a few studies in Thailand about its incidence and risk factors.

**Objective:** To study the incidence, risk factors, types of post injury MOF in a University hospital.

**Methods:** The patients who admitted to surgical intensive care unit (ICU) of King Chulalongkorn memorial hospital between 2006 -2011 were retrospectively studied. Demographic data included injury severity score (ISS), mechanisms of injury, blood transfusion, MOF type, ICU stay, hospital stay, mortality were collected. Denver MOF score were applied for evaluation.

**Results:** Two hundred and one patients were enrolled in this study, 174 were male (86.57%). Mean age was 34.62 years, mean ISS was 26.00, the major cause of injury was blunt mechanism (64.68%). Massive transfusion was administered 21.39% and post injury MOF occurred 15.92% (early MOF 40.63%, late MOF 59.37%). Mean ICU stay and hospital stay was 8.11 and 36.29 days, respectively. Overall mortality was 12.44% but in the MOF group mortality was 45.45%. Significant risk factors of post injury MOF were age > 30 years ( $p = 0.022$ ), blunt injury ( $p = 0.011$ ) and ISS > 25 ( $p = 0.032$ ). Post injury MOF increased ICU stay ( $p = 0.001$ ), hospital stay ( $p = 0.04$ ) and mortality ( $p < 0.001$ ).

**Conclusions:** Incidence of post injury MOF in a University hospital in Thailand is high and related to increasing of ICU stay, hospital stay, morbidity and mortality.

#### CHARACTERS OF MORTALITY AND TIME SERIES ANALYSIS IN THORACIC INJURY BEFORE AND AFTER RAPID RESPONSE TRAUMA TEAM ESTABLISHMENT

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**Background:** Severe thoracic injury is a life threatening condition and need prompt as well as proper treatment. Department of surgery, faculty of medicine, Chiang Mai University has established rapid trauma team (RRTT) in July 2006. The aims of this study were to verify mortality rate alteration after setting up RRTT.

**Methods:** We performed retrospective before and after designed study between January 2004 and September 2009. The month before July 2006 was defined as "before RRTT" and after was "after RRTT". Monthly mortality rate, severity injury score (ISS) and demographic data were collected.

**Results:** A total 951 patients were included [427 (30 months) in before RRTT and 524 (39

months) in after RRTT]. Of these, 83 patients (8.8%) were died after admission and analyzed for characters of mortality. The average age of mortality patient was  $38.7 \pm 16.3$  years. Male was predominant gender. The most common mechanism of injury was motor cycle accident. Although there were no difference of character and mechanism of injuries between two periods but patients associated with maxillofacial injury had significant lower mortality in after RRTT (28.5% vs. 10.5%;  $p = 0.04$ ). However; after RRTT group had higher occurrence of urinary complication and acute renal failure significantly. Average adjusted monthly mortality rate was lower in after RRTT ( $9.0 \pm 6.1$  vs.  $6.9 \pm 4.0$ ). Time series analysis between two periods demonstrated decrease trend in monthly mortality in after RRTT [coefficient (95% CI) =  $-0.61$  ( $-1.13$  to  $-0.23$ );  $p < 0.01$ ].

**Conclusion:** Rapid response trauma team establishment could be decrease mortality trend. Protective effect was predominant in patient associated with maxillofacial injury.

**Keyword:** Rapid response trauma team, trauma team activation, mortality, time series analysis

#### TRAUMA TEAM ACTIVATION: WHAT DO WE LEARN?

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**Background:** The outcomes of treatment for severe trauma victims may be improve by the early presence in the emergency room of trauma team under the leadership of an expert trauma surgeon. The criteria for activation aim to identify patient who are at risk or need higher level of care.

**Objective:** To evaluate a trauma team activation criteria after implementation at Songklanagarind Hospital, a level I trauma center.

**Materials and Methods:** Adult trauma patients (age  $\geq 15$  years) who directly come to Songklanagarind Hospital from January to December 2009 and met one or more of the trauma team activation criteria were enrolled. The criteria consisted of (I) penetrating injury to the chest or the abdomen (II) systolic blood pressure  $\leq 90$  mmHg. (III) pulse rate  $> 120$  beat per minute. (IV) respiratory rate  $< 10$  or  $> 30$ /min (V) severe head injury (GCS score  $\leq 8$ ) and (VI) trauma arrest. Data were retrieved from the trauma registry and descriptive reports.

**Results:** One hundred and fifty-three patients met inclusion criteria. The mean age was  $33 \pm 13$  years. The most of patients were male (85%) and the average ISS was 18. The most common criteria for activation was pulse rate

> 120 bpm (37%). The activation occurred about 52 percent of patients who met the criteria and the surgeon can present at resuscitation room about 75 percent of them. The procedures which commonly performed in the ER were endotracheal intubation and central venous catheterization (43%). Fifty-seven patients (37%) received emergency operation and the most common operation was exploratory laparotomy (23%). Rate of emergency operation was high in patients present with hypotension (61%) followed by penetrating torso injury (48%). The mortality rate was high in severe head injury patients (43%). All patients who present with cardiac arrest died. The average length of hospital stayed was 14 day. One hundred and two patients (67%) survived until discharge.

**Conclusions:** The majority of severely trauma patients who met the trauma team activation criteria survived until discharge. The activation occurred about half of them and the surgeon can present in the emergency department in the majority of cases. Rate of emergency operation was high in patients present with hypotension or penetrating torso injury. Trauma arrest and severe head injury patients had high mortality rate. Good compliance with the criteria may translate to improve outcomes.

**Key words:** Trauma, Team activation criteria, Triage

## MANAGEMENT OF BURN IN BANGKOK HOSPITAL MEDICAL CENTER: TEAM APPROACH

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Major burn is a serious disease and need meticulous care. At Bangkok Hospital Medical Center, we take care

major burn by radical debridement with knife, scissors and hydrojet then dressing initially by silversulfadiazine cream. The dressings were change to various silver containing dressing such as hydrofiber with silver, alginate with silver assilver-nanocrystalline. Surgeon, intensivist, pulmonologist, nephrologist, infection specialist, nutritionist, pain specialist and psychiatrist work together to control infection hemostasis of the patient such as blood albumin, respiration, creatinine and electrolyte. We retrospectively reviewed the record of all major burn. There were 62 major burn patients.

The average age was  $33.17 \pm 1$  (range from 0.75 to 78). The average %TBSA (percent of total body surface area) was  $34.9 \pm 1$  (range from 1 to 98). The average Baux score (age+%TBSA) was  $68.07 \pm 1$  (range from 10.75 to 142). The average revised Baux scores (age+%TBSA+17-if inhalation injury exist) was  $74.93 \pm 1$  (range from 10.75 to 159). Our overall mortality was 14.52%. The patient who died had larger %TBSA than survivors (%TBSA of died patients =  $70.89 \pm 1$ , %TBSA of survivors =  $24.61 \pm 1$ ) and had higher revised Baux scores (revised Baux scores of died patients =  $112 \pm 1$ , revised Baux scores of survivors =  $58.67 \pm 1$ ).

The mortality was compatible with revised Baux scores, but some of our patients had very severe injury. There were 4 of our mortality had special situation from New Year 2009 accident. There was one of them died from brain anoxia and brain death. There were 2 patients had severe muscle burns which is more than 3° burn. There was another one died from lower airway obstruction. There was another one from plane crashed in 2008 had 90%TBSA burn with severe associated injury such as inhalation injury and multiple opened fractures. We think that if our patients did not have severe associated injury as above the mortality should be lower.

## UROLOGY

### SWL 2011 IMPROVING OUTCOME

*David Tolley*

Scottish Lithotripter Centre, Edinburgh, UK

This presentation reviews the progress made in shockwave lithotripsy (SWL technology) in the last 25 years and the factors affecting outcome of treatment. It discusses ways to improve outcome with existing technology and examines the value of audit in this process.

Advances in shockwave technology are described: the success rates obtained with third and fourth generation lithotriptors match those obtained with the original Dornier

HM3 with less analgesic requirements in an ambulatory care setting.

### LAPAROSCOPIC PYELOPLASTY, VARIETY OF TECHNIQUES AND WHAT'S NEW

*Stanley Duke Herrell*

Pyeloplasty remains the gold standard for congenital and acquired UPJ obstruction. Minimally invasive surgery (MIS) in the form of laparoscopy and robotic surgery are

highly effective with reduced recovery and pain. The presenter has a large experience in primary and complex reconstructive cases using MIS and will present a variety of techniques and challenging cases. In addition, some new techniques pioneered at Vanderbilt, including microlaparoscopic repairs will be discussed.

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#### UPDATE ON IMAGE-GUIDED KIDNEY SURGERY

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*Stanley Duke Herrell*

Incorporation of imaging data into surgical procedures may revolutionize treatment and surgery for the kidney. The presenter will show ongoing research work into the incorporation of image guidance techniques into robotic and ablative kidney surgery.

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#### LAPAROSCOPIC AND ROBOTIC PARTIAL NEPHRECTOMY: HOW FAR DO WE GO?

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*Stanley Duke Herrell*

Nephron sparing surgery should be encouraged for all amenable masses and is considered a standard of care. Laparoscopic and robotic techniques are rapidly gaining popularity and will be discussed. New techniques, such as parenchymal clamping and complex reconstruction, will be reviewed with cases and videos.

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#### SIMULTANEOUS BILATERAL LAPAROENDOSCOPIC SINGLE SITE CYSTS DECORTICATIONS IN THE TREATMENT OF SYMPTOMATIC AUTOSOMAL DOMINANT POLYCYSTIC KIDNEY DISEASE

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**Introduction and Objective:** Patients with Autosomal Dominant Polycystic Kidney Disease (ADPKD) have significant morbidity due to large kidney size and the resultant compression of adjacent organs. Our objective is to present our experience with transumbilical simultaneous bilateral laparoendoscopic single site (LESS) cysts decortications in the treatment of symptomatic ADPKD.

**Methods:** A 41-year-old normotensive man with a 4-year history of ADPKD presented with complaints of chronic abdominal discomfort, marked fullness and bilateral flank pain that was greater on the left side. Both kidneys were palpable. The preoperative serum creatinine was 1.1 mg/dL and the creatinine clearance was 92.5 mL/min. The CT scan showed severe enlargement of bilateral kidney was

noted with multiple cystic lesions, ranging 0.3-8.3 cm in diameter. The cystic lesions showed no abnormal calcification or focal solid mass. The mass effect of both kidney results compressed second part duodenum and the adjacent IVC. The patient underwent simultaneous bilateral LESS cysts decortications. Pain relief was measured by comparing preoperative and postoperative visual analog pain scales. A 2-cm umbilical incision was made, and the tissues were bluntly dissected into the abdomen. XCONE port was inserted into the abdomen through the umbilicus. A 30° long laparoscope was inserted to the 5 mm access site. Special curved instruments were used in addition to standard laparoscopic instruments.

**Results:** Sixty eight major and minor cysts (20 Right and 48 Left) were identified and decorticated. The operative was 4 hours 25 minutes. The intraoperative estimated blood loss was 100 mL. Approximated 1,500 mL of cyst fluid was drained during the procedure. There were no major or minor complications or postoperative complications. The patient began oral intake after 16 hours and did not require parenteral analgesics postoperatively. The hospital stay was 4 days after the procedure. The patient returned to his usual activities 1 week postoperatively after the procedure. The wall of the cysts and cyst fluid revealed benign tissue. At follow-up, the laboratory test results were not significantly changed; the current serum creatinine was 1.0 mg/dL, the creatinine clearance was 97.6 mL/min and the creatinine clearance changed +5.5 % at 6 months. The follow-up CT show remaining cysts are largely intraparenchymal. The patient's blood pressure did not change over the course of treatment.

There was a significant reduction in the pain scale, from 7.4/10 preoperatively to 2.3/10 on follow-up.

**Conclusions:** Simultaneous Bilateral LESS cysts decortications in the treatment of symptomatic ADPKD can be done and is a feasible procedure for symptomatic relief.

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#### LAPAROENDOSCOPIC SINGLE -SITE NEPHROURETERECTOMY WITH AN ENDOSCOPIC DISTAL URETERAL APPROACH FOR THE MANAGEMENT OF UPPER URINARY TRACT TRANSITIONAL-CELL CARCINOMA

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**Introduction:** Endoscopic ureteral surgery has been proposed as a complementary step in nephroureterectomy,

either open or laparoscopic, to obviate the low abdominal incision.

**Objective:** To describe our technical details of laparoendoscopic single-site (LESS) nephroureterectomy with an endoscopic distal ureteral approach for the management of upper urinary tract transitional-cell carcinoma (TCC) based on oncologic principles.

**Method:** A 61-year-old man with a diagnosis of TCC of the left renal pelvis underwent transperitoneal LESS nephroureterectomy with an endoscopic distal ureteral approach. He had a history of open abdominal exploration for ruptured appendicitis since 10 year ago. Computed Tomography scan demonstrated left renal pelvic enhancing mass. The patient characteristic, preoperative presentation, operative details, postoperative recovery, and perioperative complications were reviewed. The patient was anesthetized generally, and then placed in a left flank position. A 3-cm umbilical skin incision was made and extended down to the peritoneum. X-CONE port was inserted through the umbilicus. Pneumoperitoneum was created. A 30° long laparoscope was inserted to the 5 mm access site. Using special curve or S-PORTAL and standard laparoscopic instruments, the LESS nephroureterectomy was performed in the same process as conventional laparoscopic nephrectomy. The renal artery was first ligated and then the renal vein was transected using Hem-o-lok clips, respectively. Then we changed the position of the patients to a supine position with a 30-degree Trendelenburg. "Pluck" transurethral detachment of intramural ureter by resection of ureteral meatus and surrounding tissue was performed with a resectoscope and subsequent cephalad extraction.

**Results:** The procedure was completed successfully without conversional laparoscopic or open surgery and without additional extraumbilical trocars or incisions. LESS nephroureterectomy with an endoscopic approach was performed in 380 minutes. The estimated blood loss of 350 mL and Pain scale was 0-1 while no morphine requirements. There was no intraoperative complication. The patient was discharged on postoperative day 3 without perioperative complications. The urethral Foley catheter was removed on postoperative day 7. The postoperative cosmetic result was excellent as the incision scar was hidden inside the belly button. Pathological analysis revealed upper transitional cell carcinoma.

**Conclusions:** According to our experience, an endoscopic approach for upper urinary tract TCC is a minimally invasive technique that is safe and effective as a complementary technique for one-step LESS nephroureterectomy and adheres to oncologic principles. Long terms of oncologic outcome are required.

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### LAPAROENDOSCOPIC SINGLE SITE EXTRAVESICAL URETERAL REIMPLANTATION IN ADULT USING X-CONE SINGLE PORT AS A TREATMENT OF VESICORETERAL REFLUX

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**Introduction:** Laparoscopic single site extravesical neoureterocystostomy is a technically demanding procedure, especially when the intracorporeal freehand suturing technique is used.

**Objective:** We report our initial experience in the treatment of vesicoureteral reflux or VUR by laparoendoscopic single site (LESS) intracorporeal and extravesical transperitoneal ureteroneocystostomy with X-CONE single port.

**Patient and Methods:** A 42-year-old woman was referred with recurrence urinary tract infection. Voiding cystoureterography revealed right vesicoureteric reflux with dilated pelvocalyceal system and hydroureter, suggestive right vesicoureteral reflux grade 3. No bladder overactivity was found during the urodynamic study. The patient underwent LESS ureteral reimplantation by the refluxing technique. After the induction of general anesthesia, endotracheal intubation, the patient was positioned in the Trendelenburg position. Cystourethroscopy was performed and a double-J-stent was inserted in right ureteric orifice. A 2-cm umbilical incision was made, and the tissues were bluntly dissected into the abdomen. The X-CONE port was inserted through the umbilicus. A 30° long laparoscope was inserted to the 5 mm access site. Special curved instruments were used in addition to standard laparoscopic instruments. Intracorporeal suturing was performed with an Endo-stitch device.

**Results:** LESS ureteral reimplantation was successfully performed in the patient. The surgery lasted for 180 min and the estimated blood loss of less than 50 mL. No intra and postoperative complications were observed. A full diet was started 24 hours after surgery. The abdominal drain was removed after 48 hours. The patient was discharged at day 4 with the indwelling Foley catheter and was called for follow-up on an outpatient basis for removal of the Foley catheter on postoperative day 7. The stent was removed 6 weeks after surgery. Follow up studies revealed complete resolution of reflux and urinary tract infection was not developed.

**Conclusion:** LESS ureteral reimplantation with X-CONE single port is an effective procedure with good results. It is an advanced LESS technique that closely

resembles open and standard laparoscopic surgical techniques and provides a safe alternative to existing methods. It is technically more challenging in terms of intraoperative ergonomics and instruments clashing and requires advanced surgical skills. Prospective studies are needed for further conclusions.

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#### LAPAROENDOSCOPIC SINGLE SITE SURGERY (LESS) RADIOFREQUENCY ABLATION TREATMENT FOR RENAL CELL CARCINOMA

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**Introduction:** Nephron-sparing surgery is now accepted as an alternative treatment option for small renal tumors. However, hemostasis during laparoscopic partial nephrectomy can be technically challenging, especially without hilar vascular clamping. RFA has been increasingly applied in the management of small renal tumors. We reported our experience of laparoendoscopic single site surgery (LESS) radiofrequency ablation (RFA) for the treatment of small renal tumors. Our objective was to assess the short-term oncologic efficacy of RFA.

**Material and Method:** LESS of RFA with a temperature-based radiofrequency generator was performed on a exophytic renal tumor size range 2.7cm (c T1N0M0) in a female patient age 61 years. Using the hand-assisted laparoscopic approach, the kidney is mobilized transperitoneally, and the renal tumor with overlying perinephric fat is exposed. Initial contrast-enhanced computed tomography (CT) examination was performed 21 days after the procedure, with subsequent CT assessment at three months, six months, and every six months thereafter. Serum creatinine measurement was conducted along with each time CT examination. We evaluated the technical success, technical effectiveness, ablation zone, benign periablation enhancement, irregular peripheral enhancement, and complications.

**Results:** The tumor was biopsied before RFA, of which was diagnosed as renal cell carcinoma (RCC) Furhman nuclear grade II. Under laparoscopic ultrasonography control of tine placement, a ???-minute thermoablation cycle at 100 degrees C mean temperature was performed. The operative time was 210 minutes, with an estimated blood loss of 100 mL and no patient required a blood transfusion and postoperative hospital stays of 3 days. Technical success and effectiveness was achieved. There was complete ablation. No death or renal failure after the procedure has yet been found. Abdominal CT

scans after 3 weeks confirmed complete treatment of the lesion

**Conclusion:** Our results showed that the LESS RFA on small renal mass was safe as an alternative treatment for exophytic RCCs and represents a promising treatment for some patients with small RCCs. Further research and a longer follow-up period are needed to confirm our results.

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#### ESTROGEN AND PROGESTERONE RECEPTOR IN PATIENTS WITH BLADDER PAIN SYNDROME

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**Objective:** The hypothesis of the present study is whether bladder mucosa of patients with bladder pain syndrome (BPS) have estrogen receptor (ER) and progesterone receptor (PR) more than normal population.

**Material and Method:** From July 2009 to December 2010, 15 female patients with chronic bladder pain syndrome and 10 female patients without bladder pain were enrolled in this study. Three pieces of trigonal bladder mucosa were biopsied and sent for estrogen receptor and progesterone receptor immunohistochemistry staining by the Benchmark automated machine. The results were reported as positive and negative and then compared between 2 groups.

**Results:** Estrogen receptor was found in 14 out of 15 patients in BPS group (93%) and in 7 out of 10 patients in control group (70%). Progesterone receptor was found in 10 out of 15 patients in BPS group (66.7%) and 5 out of 10 patients in control group. Both were not significantly different with  $p = 0.267$  and  $p = 0.678$ , respectively.

**Conclusion:** The authors concluded that ER and PR might not play a role in the etiopathogenesis of BPS/IC. However, other receptors should be further investigated about their role in this type of pain.

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#### ULTRASTRUCTURAL STUDY OF THE DETRUSOR IN END STAGE RENAL DISEASE

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**Background:** After successful renal transplantation, almost 50% of the patients make complaint of lower urinary tract symptoms. There is no definite conclusion to explain

these voiding symptoms, and ultrastructural study of detrusor muscle in end stage renal failure has never been carried out before.

**Objective:** We therefore studied ultrastructural changes of detrusor muscle in the specific group of end stage renal disease patients.

**Materials and Methods:** Detrusor biopsy of 20 patients, including 15 in end stage renal disease and 5 in normal creatinine patients, was obtained by open technique. Biopsy was done during the reimplantation of the ureter at the time of kidney transplantation. In normal renal function group, detrusor biopsy was done at the time of open bladder surgery from other urologic diseases. The specimens were processed for light microscope and transmission electron microscope using standard techniques. Results: All specimens from open biopsy provided sufficient quality to be examined by electron microscope. The average creatinine level was 9.2 and 1.0

mg/dl in ESRD group and control group, respectively. In ESRD group, all showed hypertrophy of muscle bundles, fibrosis between muscle bundles, muscle bundle degeneration, and fragmentation of muscle cells. 93% in ESRD group had fibrosis around nerve bundles and enlarged muscle cell nuclei. 60% had enlarged nerve bundles, and 53% showed amorphous inclusion in muscle cells. The ESRD group displayed many more ultrastructural changes than in control group and some appearances were not present in control group.

**Conclusions:** There were distinct ultrastructural changes of detrusor muscles in ESRD patients. It is possible that these ultrastructural changes of detrusor muscles may be associated with voiding dysfunction after kidney transplantation.

**Key words:** detrusor, ultrastructural, end stage renal disease

## VASCULAR SURGERY

### ANATOMICAL STUDY OF INTERNAL ILIAC VEIN IN SOFT CADAVERS

**Introduction:** Anatomy of internal iliac vein is variable which could be problematic while performing aggressive pelvic dissection. Although several types of variation have been reported, classification of these variations has not been well established. The aim of this study was to report the classification of the internal iliac vein variation and to report new venous branches in the pelvic venous system discovered during dissection.

**Material and Methods:** Anatomical dissection of internal iliac vein was performed in 20 soft cadavers, 10 male and 10 female. The anatomy of internal iliac vein was classified into normal anatomy and anatomical variation. Normal anatomy was defined when there was one main trunk of internal iliac vein, which compose of anterior division (obturator vein, inferior gluteal vein, internal pudendal vein, middle rectal vein) and posterior division (superior gluteal and lateral sacral vein). The internal iliac vein deviated from the normal pattern was classified into anatomical variation.

**Results:** Normal anatomy of internal iliac vein was found in 11 cadavers (55%). The internal iliac vein deviated from the normal pattern discovered in this study including two main trunks of internal iliac vein pattern and middle

sacral trunk pattern. Two main trunks pattern was found in 8 cadavers (40%) while the middle sacral trunk pattern was found in one cadaver (5%). In addition, new pelvic vein branches including pelvic side wall tributary and S1 tributary were found in all cadavers.

**Conclusion:** The variation of internal iliac vein is common. The classification of variation established in this study may be helpful for surgeons while performing aggressive pelvic dissection. Further study is warranted.

### THORACIC VASCULAR SURGICAL EXPOSURE

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Rapid decision making in exposure of vascular injuries is critical to mortality following penetrating trauma. Access to the thoracic inlet, the mediastinum and lower neck are often challenging from the standpoint of exposure and temporary tamponade. The principles of thoracic inlet vessel exposure, the use of median sternotomy, resuscitative thoracotomy, and the principles of exposure of the aorta at the level of the diaphragm will be reviewed and emphasis on proximal and distal control and adequate exposure for repair or ligation will be emphasized.



## WOUND CARE

### A CASE REPORT OF 0.1% BACTAINE AND 0.1% POLYHEXANIDE (PRONTOSAN®) IN WOUND CARE

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A wound with infection need meticulous wound care and debridement. Conventional daily wound debridement and wound dressing cause severe pain and high cost. A case report was using 0.1% Betaine and 0.1% Polyhexanide (Protosan (r)) and modern advanced dressing can reduced pain and cost of wound care.

A female with infected epidermal cyst about 3 cm. in diameter at lateral side of her left knee, the surrounding tissue was infected also. The infection did not response to antibiotics so excisional biopsy was done. The wound was left opened. She was very sensitive to pain so conventional daily debridement could not be done. Irrigations and packing the wound with Protosan for 10 minutes then dressing with Silver alginate (AskinaCalgitral thin) was done every 3-4 days. Until there was minimal debris at wound base, the dressing was changed to dry hydrogel with foam (AskinaTransorbent®), but still use Protosan. The wound was healed in 5 weeks without suturing.

### THE EFFICACY OF WF10 (IMMUNOKINE) ADJUNCT TO STANDARD TREATMENT FOR DIABETIC FOOT ULCERS

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**Background:** Diabetic foot ulcer (DFU) is the leading cause of hospitalization and limb amputation. Clinical studies have reported that 25-50% of infected DFUs lead to a minor amputation, whereas 10-40% requires major amputations. Infection and ischemia are major risk factors of limb amputation. WF10 has been shown to have anti-inflammatory and anti-infectious effects which mediated by increasing immune response, exerts a marked phagocytic activity of macrophages and increase tissue oxygen tension. We have previously reported on the efficacy of WF10 adjunct to standard DFU treatment significantly reduced infection/inflammation, necrotic tissue, and enhanced granulation tissue formation in the double-blind, randomized, placebo-controlled trial.

**Objectives:** To evaluate the safety and efficacy of WF10 therapy in the treatment of DFU.

**Materials & Methods:** A retrospective review of medical records was carried out in 129 patients with DFU who received WF10 treatment during July 2009-June 2010. The patient's presentations in this study were classified as: neuropathic ulcer (occur on high plantar pressure area), ischemic ulcer (ischemic necrosis/gangrene and some degree of infection), and severe infected ulcer (severe inflammation (i.e. necrotizing fasciitis, severe cellulitis, deep abscess, osteomyelitis)). Patient demographics included age, gender, wound type, co-morbidities, and concomitant treatments. Wound assessments were monitored using Wound Severity Scores (WSSs) (range 0-16). The reduction of WSSs to 0-1 (full of granulation tissue with re-epithelialization) indicates the good response. Increase or no change in WSSs reflects poor response. Safety evaluation was monitored in all patients.

**Results:** The total of 129 patients presented with 21 (16.3%) neuropathic ulcer, 49 (38.0%) ischemic ulcer and 59 (45.7%) severe infected DFU. There were 86 (66%) patients had a good response in average  $10.8 \pm 9.0$  (2-43) weeks, and a poor response was noted in 11 (8.5%) patients after follow up for  $11.4 \pm 2.7$  (6-16) weeks. Minor amputation was necessary for 12 (9.3%) patients, but no major amputation. The outcome of treatment in different wound types showed the percentage of good and poor response in the patients with neuropathic ulcer (81 and 0%), ischemic ulcer (43 and 18%), and severe infected ulcer (76 and 3%), respectively. The treatments were well tolerated. Six patients (4.73%) had developed anemia after WF10 treatment which could be managed by RBC replacement. Precaution should be taken in patient with severe underlying heart disease.

**Conclusions:** WF10 adjunct to standard treatment for DFU is a safe and effective method.

### CASES REPORT OF LARGE CHRONIC INFECTED PELVIC WOUNDS BY HYDROSURGERY DEBRIDEMENT

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Infected chronic wound needs meticulous debridement and wound care. Debridement of large wound needs general anesthesia which effect on patient's homeostasis and high cost 3 chronic infected wounds at pelvic area in 2 patients, each wound were about 5% body surface area in size were reported by using hydrosurgery

(Vergaget®) and Hydrofiber with silver (Aquacel Ag®) dressing every 2-3 days. The wounds could be closed in 2, 3 and 4 weeks, respectively. The duration of treatment was short, caused tolerable pain, resulting in appreciated of the patients.

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#### **DISTAL RESECTION OF THE HALLUX PROXIMAL PHALANX A PROMISING TECHNIQUE FOR TREATING DM RECALCITRANT HALLUX CALLUS ULCER**

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**Introduction:** Recalcitrant hallux callus ulcer in DM patients are not uncommon even though undergone conservative modalities. As well as the DM foot wounds will be risky for minor or major amputation. Preventive or treated operations have been developed for this problem. In case of related operations are osteotomy, interphalangeal arthroplasty, arthrodeses or Keller's operation for hallux ulcer, hallux rigidus for example.

**Methods:** A retrospective review, the DM patients with recalcitrant hallux callus ulcer between 2007 and 2010 was performed to assess the results of treating DM recalcitrant hallux callus ulcer at medio-plantar area of

hallux interphalangeal joint (IPJ) with distal resection of the hallux proximal phalanx (PP). Mean follow up in 13 patients was 1.9 years. The technique of operation, results, complications and recurrent rate are discussed. Results: The duration of the follow up ranged from 5 months to 3 years and 7 months (mean 1.9 years), 4 men, 9 women, their ages ranging from 47 to 69 years (mean 58.3) with DM type 2 for 3 to 30 years (mean 12.3). Local anesthetic operative time ranged from 45 to 90 min. Almost patients with hallux IPJ hyperdorsiflexion was observed for one night hospital staying except 7 days staying in one because hallux osteomyelitic ulcer on the other hallux. No need for plaster immobilization, no K-wire fixing, limiting activities (careful walking) for the first 1-2 weeks. All 13 chronic recalcitrant hallux callus ulcer have healed and healing time ranged from 3 to 4 weeks (mean 3.5) with minimal complication. The surgical wound healing time ranged from 3-4 weeks (mean 3).

**Discussion:** The successful rate of hallux callus ulcer healing is very promising with a hundred percent by this technique even though 2 feet (hallux) with late recurrence. Operative technique is easy to train with simple instruments. Surgical wound healing was normal in cases without significant arterial compromised. Minor or acceptable complications were observed.