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Abstracts
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GENERAL SURGERY

Assessment and Outcome Following the Resection of Colorectal Liver Metastases

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Introduction: During a four year period (1997-2000) 224 patients with suspected liver metastases from colorectal cancer were referred to the Sheffield hepatobiliary program.

Methods: The assessment of these patients before hepatic resection comprised an assessment of fitness for major surgery and a high resolution spiral contrast enhanced CT scan of the thorax, abdomen and pelvis to rule out extrahepatic disease. If extrahepatic disease was not present, an MRI scan of the liver was undertaken to assess the size, number and distribution of liver metastases. Suitable patients underwent laparotomy.

Results: One hundred and five patients did not undergo surgery due to presence of extrahepatic disease on CT scan (n=47), adverse distribution of metastases within the liver (n=38), liver lesion found to be benign on MRI scan (n=10) and unfit for major surgery (n=11). One hundred and nineteen patients underwent laparotomy and 109 had a hepatic resection with curative intent. Ten patients were found to have pertioneal (extrahepatic) disease which was not detected on preoperative CT scan and resection was abadoned. Only two patients had lesions detected on intraoperative ultrasonography which were not seen on the MRI scan, indicating the accuracy of this imaging modality. Operative mortality of patients undergoing liver resection was 2 per cent and median hospital stay 11 days. Patients with synchronous metastases were given a course of postoperative chemotherapy, whereas those with metachronous disease were followed in the outpatient department with 6 monthly ultrasound scanning. The 1, 2, and 3-year survival following resection with curative intent was 78, 61 and 54 per cent respectively.

Conclusion: This study demonstrates the need for specialist centres in the treatment of colorectal hepatic metastases and the good outcome that can be obtained.

Endoscopic Management of Massive Rectal Bleeding from Rectal Dieulafoy's Lesion

S Treesaranuwattana

Introduction: Dieulafoy's lesion is a caliber-persistent submucosal artery associated with small mucosal defect. Gastrointestinal (GI) bleeding suddenly occurs when exposed vessel rupture and potentially life threatening if being unrecognized. Endoscopic treatments include injection, thermocoagulation, clipping and band ligation method. Surgery and angiography are the alternative method if endoscopy is inaccessible or failed. Endoscopic ultrasound is helpful in identifying vascular lesion and guiding for injection therapy. Lesion may be found anywhere along GI tract but proximal stomach is of most frequency. Only 19 cases of rectal Dieulafoy's lesion have been reported since 1991.

Case report: A 70 year-old woman presented with massive rectal bleeding. Colonoscopy revealed typical appearance of Dieulafoy's lesion in the rectum. She was successfully controlled with endoscopic treatment by combination of electrocoagulation and heater probe without recurrent bleeding in one year. Five years earlier,

she was operated because of massive upper GI bleeding from a minute mucosal ulcer with visible bleeding vessel at lesser curvature of stomach. We believed that she was the first reported case of GI bleedings from two Dieulafoy's lesions, one in rectum and the other in the stomach.

Proctectomy and Colo-anal Sleeve Anastomosis (Parks' operation) in the Treatment of Radiation-induced Rectovaginal Fistula.

R Pakart, T Vajrabukka

Aims: To assess the role of proctectomy and coloanal sleeve anastomosis (Parks' operation) in the treatment of radiation induced rectovaginal fistula.

Methodology: The clinical feature, operative techniques and outcomes of 11 patients with radiation induced rectovaginal fistula who underwent proctectomy and coloanal sleeve anastomosis from February 1988 to March 2000 were reviewed.

Results: Eight patients achieved satisfactory continence inspite of varying degree of anastomotic stenosis. One patient had incontinence and the fistula recurred. Two patients who had urinary incontinence refused closure of colostomy.

Conclusion: Proctectomy and coloanal sleeve anastomosis is applicable in selected patients. Modifications of original operative technique, such as splitting of the rectal cuff as well as the uterus and curettage of remaining rectal mucosa, are required when there is severe associated damage. Significant anal canal damage, loose motions and uncontrolled urinary incontinence are contraindications. Preliminary colostomy should be avoided as it may interfere with subsequent mobilization of the colon. Patients should be selected carefully with regards to physical and mental suitability to undergo this major and staged operation with prolonged postoperative rehabilitation.

A Double-Blind Randomized Controlled Trial Comparing Harmonic Scalpel Haemorrhoidectomy, Bipolar Scissors Haemorrhoidectomy and the Standard Milligan-Morgan Operation

CC Chung, JPY Ha, YP Tai, MKW Li

Objective: To compare the outcome of patients receiving Haemorrhoidectomy using Harmonic Scalpel (HSH), Bipolar Scissors (BSH) and Standard Milligan-Morgan Technique (MMH).

Methods: Patients presenting with three irreducible prolapsing piles (third or fourth degree) are recruited for randomization into the study. Patients with the following condition are excluded: (1) acute strangulated or thrombosed piles; (2) previous history of anorectal surgery; (3) inflammatory bowel diseases; (4) hematological disorders; (5) patients considered anaesthetically unfit for surgery; (6) no informed consent. An independent person (Ha JPY, unaware of the randomization) assessed the patient during the in-hospital postoperative period and at 4 weeks after the operation. The measured outcomes include: (A) in-patient stay: (1) operation time; (2) blood loss; (3) hospital stay; (4) visual analogue pain score; (5) date of first bowel motion; (6) number of Pethidine injections and Dologesic tablets; (7) complications; and (B) at 4 weeks followup: (1) time to return to normal activity; (2) wound healing; (3) anal stenosis; (4) faecal/flatus incontinence; (5) satisfaction score. Statistical tests used include one-way Annoval test and Bonferroni test.

Results: Between April 1999 and January 2001, 86 patients were randomized into HSH (29), BSH (30) and MMH (27). The age and sex distributions among the 3 limbs are comparable. The operation time is similar in the 3 limbs. HSH and BSH are associated with significantly less blood loss ($p<0.05$) when compared with MMH. HSH is superior to both BSH and MMH in terms of reduced postoperative pain, and patients in HSH limb required significantly less Pethidine injection than patients in MMH limb. Though hospital stay and time off work remains similar, patients in HSH has the best satisfaction score at 4 weeks.

Conclusion: The present trial shows that HSH is as good as BSH in terms of reduced blood loss, but is superior since it is associated with less postoperative pain. The best satisfaction score among the 3 limbs reinforces this.

Total Sacrectomy: King Chulalongkorn Memorial Hospital Experience Report of Two Cases

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Objective: Surgery for large sacral tumor is a complex operation. It is difficult to obtain a wide tumor-free margin because of its complicated anatomic location. We describe our experience in two cases of total sacrectomy.

Materials and Methods: We carried out 'En bloc' total sacrectomy and extended total sacrectomy for chordoma and giant-cell tumor, respectively. Removal of tumor was planned in two stages. The first stage consisted of midline celiotomy, dissection of visceral/neural structure, construction of colostomy and ligation of branches of internal iliac vessels followed by an anterior L5-S1 discectomy

with ventral sacroiliac osteotomy. The second stage consisted of L5 laminectomy, ligation of thecal sac, complete L5-S1 discectomy, dorsal sacroiliac osteotomy and tumor removal posteriorly. For the management of large pelvic defect, we used an inferior-based myocutaneous rectus abdominis pedicle flap for the first patients and we used Hartmanns' stump to protect pelvic herniation with bilateral gluteus maximus flap for the other. Iliolumbar reconstruction was done immediately in the first patient and interval reconstruction for the second one because of infection.

Results: Both patients can acheive effective local pain control with acceptable postoperative complication. Local recurrence was detected in the first patient at the 1-year and 7-month follow-up while the second patient is disease-free at the 1-year and 4-month follow-up.

Conclusion: Team of surgeons played an important role in the success of operation. Inspite of the serious structural and neurological damage, total sacrectomy can be a merit in term of improving morbidity and mortality.

Preliminary Results of Laparoscopic Segmentectomy in Recurrent Pyogenic Cholangitis

CN Tang, CH Chau, WT Siu, MKW Li

Background: Among various treatment options, segmentectomy of the atrophic lobe together with stone lithotripsy is the most effective approach in patients with recurrent pyogenic cholangitis (RPC).

Aim: This study was to assess the technical feasibility and safety of hand assisted laparoscopic segmentectomy (HALS) in patients with RPC.

Patients and Methods: From February 2000 onwards, patients with RPC and with evidence of frequent cholangitis, segmental atrophy and multiple intrahepatic ductal stones were selected for HALS. Patients were excluded if there were (1) evidence of malignant transformation, (2) bilateral intrahepatic ductal stones, (3) stones located in postero-superior segments (Couinaud 4a, 7, 8). The preoperative investigations included percutaneous US, ERCP, CT scan, liver and EHIDA muclear scintigraphy. The operation was carried out using hand-assisting technique with the stone-harboring segment resected laparoscopically using Hamonic Scalpel and ultrasonic aspirator. The stone distribution was outlined by laparoscopic ultrasound (LUS) and clearance of resection was confimed by operative choledochoscpy and LUS again. All patients would then be followed-up with regular liver function test and imaging study if required.

Results: Six patients had the HALS attempted. All of these patients were female of mean age 54.5 (28-69). Five patients had the laparoscopic segmentectomy successfully performed. There was one open conversion due to bleeding from left hepatic vein. The mean operating time was 230 mins (175-290 mins). Average blood loss was 430 ml (200-400 ml). Median postoperative stay was 6.5 days (5-60 days). There was one patient developed postoperative bile leak and bilio-pleural fistula. This patient recovered with percutaneous drainage. The remaining 5 patients recovered uneventfully and had no recurrent attack upon a mean follow-up of 7 months.

Conclusion: The preliminary results did confirm the feasibility and the potential advantage of HALS in patients with RPC. Slight refinement and improvement of ancillary technology might further improve the results.

Comparatives Study Between Polyethylene Glycol and Sodium Phosphate Solution in Elective Colorectal Surgery

B Chaleoykitti

The aim of the study was to compare patient tolerance and safety of PEG and NaP solution for preoperative bowel preparation in elective colorectal surgery.

Methods: All colorectal cancer patients who underwent elective colorectal surgery and received PEG or NaP solution 90 ml and a glass of water between July 1997 and April 2001 were included in the study. Serum sodium and potassium before and after bowel preparation, patient tolerance, and postoperative sepsis were assessed. Chi-square test and-test were used for statistical analysis.

Results: Eighty-six patients in PEG group and 25 patients in NaP group, well matched for age, gender, and operation were included in the study. Patient tolerance to NaP was superior to PEG. There was significant increase in serum Na level and significant decrease in serum K level in NaP group, but not in PEG group. Wound infection rate was lower in NaP group than in PEG group.

Conclusions: NaP solution was better tolerated and had less wound infection than PEG but had significant change in serum electrolytes.

Hepaticojejunostomy with Jejunal Limb Accessed Via Stomach as a Treatment for Hepaticolithiasis

A Methasate, V Boonnuch, P Watanapa, D Lohsiriwat

Surgery for hepatolithiasis usually includes additional creation of a hepaticocutaneous jejunostomy after conventional surgery to provide atraumatic access to the biliary system for the removal of the recurrent stones. However,

access via this route is troublesome and requires care of the fistula created.

In this study, we used interposed jejunal limb anastomosed to lesser curve of the stomach as an access limb to the biliary system. The operations were performed through gastroscopy. Visualisation of the biliary system was achieved and recurrent stones were extracted using Dormia basket. No complications occurred during the follow up.

We conclude that, compared to conventional hepaticocutaneous jejunostomy, jejunal limb accessed via the stomach is a novel technique useful in the treatment of recurrent stones. It can provide access to the biliary system using standard gastroscopy and avoid the complications usually associated with the conventional techniques.

Transhepatic Exploration for Left Intrahepatic Stones

P Soontrapornchai

Introduction: Intrahepatic stones are difficult to remove due to its associated proximal stricture and frequent recurrence even after complete stone removal. Two main treatments are suggested. Liver resection is indicated for left-sided stones when the patient has atrophic segment or lobe of the affected liver. Percutaneous transhepatic cholangioscopy is indicated for bilateral or recurrent stone but has some failure and stone recurrence rate.

Objective: The aim of the study is to report personal experience in the management of left intrahepatic stones by transhepatic approach.

Methods: Three patients underwent exploratory laparotomy for intrahepatic stones between June 1998 and March 2001. All patients had been failed to treatment by endoscopic stone removal (ERCP). Two of them had bilateral hepatic stones. At operation, the left hepatic duct, either in segment II or III, was located by palpation of the stones or intraoperative ultrasound then the duct was opened longitudinally via hepatotomy. Stones were removed by stone forceps or choledochoscope. Finally, the Roux limb of jejunum was brought to anastomose with the widely opened duct.

Results: All patients recovered uneventfully. Wound infection occurred in one case. The follow-up period was between 2 months and 3 years. Two of them were asymptomatic and no stone recurrence during follow-up. One patient developed recurrent cholangitis in which sclerosing cholangitis was suspected by cholangiogram and was treated by stenting.

Conclusion: Transhepatic exploration offers some advantages: 1) to avoid the hepatectomy in the case of liver hypertrophy in which its parenchyma is preserved, 2) less morbidity and mortality than liver resection, 3) easier stone removal than percutaneous method, and 4) the presence of hepaticojejunostomy providing good bile drainage to prevent stone recurrence.

Endoscopic Thyroidectomy by Axillary Approach : First Consecutive 6 Cases in Rajavithi Hospital

S Chantawibul, S Lokechareonlarp, V Benjasirichai, C Pokawatana

Background: Transverse surgical scar after conventional thyroidectomy is one of the unavoidable problem. Endoscopic thyroidectomy performed via the axillary approach leaves no scaring of the neck and provide an excellent cosmetic results. The axillary scar usually not seen in natural arm position.

Methods: From 10th April 2001 - 31st May 2001, we performed 6 cases of lobectomy and ischmectomy by this technique. One 10-mm port for endoscope and three 5-mm ports for instruments and suction were inserted on the same side of diseased thyroid lobe. The CO_2-insufflation pressure is set below 4 mmHg and dissection mainly using an ultrasonically activated shears.

Results: All 6 patients were successfully performed with no conversion to conventional technique. Mean operating time was 253.3 minutes and blood loss was 243.3 ml. Recurrent laryngeal nerves were clearly indentified in every cases and no hoarseness was noted after surgery. One case developed a 20 ml seroma on 10th postoperative day and was treated by simple aspiration. The patients were discharged at 6.8 postoperative day by average.

Conclusion: Endoscopic thyroidectomy by axillary approach for benign thyroid diseases gives promising cosmetic results.

Ruptured Coeliac Artery Pseudoaneurysm Complicated in Pancreatic Necrosis

Y Sirivatanauksorn, D Lohsiriwat, W Riensuwarn, C Iramaneerat, C Paphangkorakit

Massive haemorrhage into the gastrointestinal tract, retroperitoneum and peritoneal cavity associated with pancreatitis represents an uncommon evidence but extremely formidable for the high mortality rate. Pseudocyst, severe inflammation, necrosis and infection may cause major vessels erosion with or without pseudoaneurysm formation. A case of ruptured coeliac artery aneurysm complicated in pancreatic necrosis in a 42 years old man with chronic alcoholic abuse is presented. The

patient presented with abrupt onset of severe epigastric pain after one month of chronic pain radiating to the back. CT scan examination of the abdomen showed a large haematoma walled-off by the body of pancreatic necrotic parenchyma. Angiography was performed and demonstrated false coeliac artery aneurysm with rupture into the body of pancreas. Nevertheless, embolisation was unsuccessful due to large neck of pseudoaneurysm and the high blood flow into the haematoma. Suturing ligation after aortic cross clamping successfully ceased the bleeding pseudoaneurysm. The postoperative was uneventful. The patients was discharged from the hospital and has been well. One-month follow up CT scan showed mild residual pancreatic necrotic tissue and no demonstratable bleeding or haematoma. Massive haemorrhage complicating infected necrosis or abscesses implies a worse prognosis when compared to severe bleeding associated with pseudocyst with or without pseudoaneurysm. Angiographic control is essential guideline for successful approach to the most unpredictable complication of pancreatitis. Surgical procedures should be immediately instituted when embolisation fails. Whereas splenic, gastroduodenal and superior pancreaticoduodenal arteries are the most commonly involved vessels. To date, very few cases of the coeliac artery involvement were reported.

Mastectomy Without Drain at Pectoral Area: A Prospective Randomized Controlled Trial

P Puttawibul, B Sangthong, T Maipang, S Pornpatanarat, S Sampao, P Uttamakul, N Apakupakul

Background: Mastectomy is still one of the standard alternative procedures for the management of female breast cancer. Axillary node dissection is also performed to establish the accurate staging. After operation, the axilla must be drained because of lymphatic leakage. Whether the raw surface at pectoral area should be drained or not is an interesting controversial point.

Objective: To compare outcomes after modified radical mastectomy (MRM) with and without drainage at the pectoral area.

Design: Prospective randomized controlled trial.

Patients: Sixty patients who accepted to be treated with MRM and gave their consent were enrolled. Mastectomy was performed to remove the breast tissue proper by scalpel in order to minimize tissue injury. The axillary contents were removed by sharp instrument. After bleeding was stopped, patients were randomly allocated into one or other of 2 groups: group I (n=30): only 1 drain was inserted at the axilla area; group II (n=30): conventional 2 drains were inserted into the pectoral area and axilla area. The size of tube drain and negative suction pressure were constant in all cases. Volume of contents was recorded daily. Subcutaneous seroma or hematoma was carefully observed and confirmed by ultrasonography at 3-5 days after operation. Overall drainage contents and complications were compared.

Results: The mean weight of breast tissue of group I was 632.1 g. and group II was 654.0 g. (p=0.8106). Total drainage contents (mean ± SD) from the two groups were $347.8 \pm 74.7\ cm^3$ and $271.4 \pm 36.4\ cm^3$ respectively (p=0.36). Complication occurred in 1 case in group I and 2 cases in group II (p=0.35). None of the above differences was statistically significant.

Conclusions: Mastectomy by scalpel can be performed without drainage at the pectoral area. Overall complications in the conventional group and the group without drain did not differ significantly.

Perineum Push Up Device to Facilitate Transabdominal Suturing of Lower Rectum

A Rojanasakul

Objectives: The author had invented a special device for pushing up the perineum to facilitate transabdominal suturing of lower rectum.

Materials and Methods: The device is made of polypropylene. The head af the device looks like a pacifier. The shaft is about 30 cms in length. The base is flat and round. During the applications the head of the device push at the anus and the base is pressed by the assisting surgeon's abdomen, thus the assisting surgeon can use both of his hands to assist the surgeon.

Results: The device was used in 15 patients. The average distance gained by pushing up the rectal stump was 4 cms. The device helped to make suturing of the rectal remnant more feasible. No specific complication related to the usage of the device was detected, and there was no clinical leakage of the anastomosis in this group of patients.

Conclusion: Perineum Push Up Device, to facilitate transabdominal suturing of lower rectum was invented. The device was tested in 15 patients with impressive results.

Study on Performance Following The Key Performance Indicators for Trauma Care, Khon Kaen Hospital

W Chadbunchachai

Introduction: Establishing the Key Performance Indicators (KPIs) is regarded as significant step of setting

up standard and monitoring trauma care. Performance following KPIs contributes to good quality of trauma care and reduction of preventable death rate. Therefore, encouraging relevant personnel to follow the KPIs as much as they can, has the good effect to the trauma care. Monitoring performance of personnel is a strategy that they can use the feedback to improve their working process.

Objective: To study the personnel's performance following 27 indices of KPIs for trauma care in Khon Kaen Hospital.

Methods: A working team was set up for monitoring the performance of involved personnel. The database for monitoring was from Trauma Registry Program (76 variables) which was put into the routine work of Trauma Center and collected additional 8 variables which were not included in Trauma Registry. The nurses in Trauma and Orthopedic ward filled in the additional 8 variables in the form. After data entry and analysis, the feedback from the analysis was sent to the working team.

Results: There are 11 of 27 KPIs indices having percentage lower than 80, namely intravenous fluids exceed 2000 ml given before blood given (53%), exploration of the wound later than 1 hour after arrival (50%), spending time in CT scanning department more than 1 hr (27%), having C-spine X-rays for injury above clavicle (31%), having cervical collar for injury above clavicle (28%), fixation of open fracture within 8 hrs after arrival (27%), time to craniotomy more than 4 hours after injury (82%), reduction of joint dislocation more than 4 hours after arrival (21%), laparotomy BP<90 in 60 minutes (22%), time to laparotomy more than 4 hours after injury (33%) and ischaemic limb re-vascularized within 4 hours of injury (33%).

Conclusion: Following KPIs of personnel is the significant factor of improving the standard of trauma care. KPIs index is the tool for monitoring the personnel's performance following KPIs. The KPIs index obtained from database of trauma registry that is available need to collect more variables additionally.

ORTHOPAEDIC SURGERY

Morphological Study of 108 Thai Proximal Femora: Results of A New Method of Geometrical Assessment Using 3-Dimensional Reverse Engineering Technique

ELJ Bohez, P Oris, B Mahaisavariya, K Sitthiseripratip, T Tongdee

Objective: The purpose of this study is to present a new method of using computerized tomographic image combined with the three-dimensional reverse engineering technique for computer-aided design (CAD) to analyze the three-dimensional geometrical data of the Thai proximal femora both for the outer surface and the shape of femoral canal. The data will be relevant to the development of design for trochanteric nail and proximal femoral prosthesis for Thai patients in next step of our future work.

Mothod: One hundred and eight Thai cadaveric femora from the Department of Anatomy, Faculty of Medicine Siriraj Hospital were used for this study. The donors were 26 males, 22 females and 12 unknown genders with ages ranged from 22 to 83 years (average 48.5) at the time of death. All cadaveric femora were scanded with Philips spiral CT scanner (Tomoscan AV). Three-dimensional models were extracted from the computerized tomographic images and built with the reverse engineering technique. The following parameters were calculated for each femur. 1) Femoral head was calculated with the use of least square method to fit a sphere to the three-dimensional data of the head portion. 2) Femoral neck axis was derived from the line that started from the center of femoral head and passed through the center of the isthmus portion of the neck which can be located by using least square method to fit the circle in cross-section plane of femoral neck. 3) Femoral shaft axis was derived from the line that pass through the center of the circle of each cross-section starting off from the isthmus of the femur to the lesser trochanter. 4) Anteversion angle: this angle was determined by the degree that the projection of femoral neck axis deviated from the coronal plane. 5) Neck-shaft angle: this angle was measured at the angle between the tangent plane of the femoral neck axis and femoral shaft axis.

Results: The femoral head diameter and the femoral neck diameter at isthmus averaged 44 mm and 29 mm respectively. The isthmus of femoral shaft located at an average of 113 mm distal to the lesser trochanter with an average canal diameter of 10 mm. The anteversion averaged 11 degrees with high variation from 0 to 35 degrees. The

neck-shaft angle averaged 128 degrees.

Conclusion: This study presents a new method of geometrical analysis of proximal femur with 3-dimensional reverse engineering technique. The data can represent the geometrical data of Thai proximal femora which can be used for the design of proper size and shape of the femoral prostheses and trochanteric nail system to serve Thai patients in the future via computerized data based (CAD-CAM technology).

Morphology of the Radial Head: An Evaluation Using Three-dimensional Anatomical Data of the Radial Bone

ELJ Bohez, B Mahaisavariya, B Saekee, T Tongdee

Objective: The objective of this study is to present a new method of morphometric study using computerized tomographic image combined with the 3-dimensional reverse engineering technique for computer-aided design (CAD) to analyze the 3-dimensional geometrical data of the Thai proximal radius. The method can evaluate both the outer surface and the shape of intramedullary canal and will be relevant to the development of proper design for the radial head prostheses for Thai patients in the future.

Materials and Methods: Forty cadaveric radial bone from the Department of Anatomy, Faculty of Medicine Siriraj Hospital were used for this study. The donors were 12 males and 10 females with ages ranged from 32 to 76 years (average, 56.3) at the time of death. All cadaveric radial bones were scanned with Philips spiral CT scanner (Tomoscan AV). Three dimensional models were extracted from the computerized tomographic images and built with the reverse engineering technique. The following parameters were evaluated from each specimen including: thickness and diameter of radial head, tilting angles of radial head, the depth and surface area of the concavity of the articular surface of the radial head, and total length and radius of curvature of radial bone.

Results: The radial head diameter averaged 20 mm (range, 16-24 mm). Intramedullary canal of the radial neck average 6.7 mm (range, 5.2-9 mm). The thickness of the radial head was larger at ulnar side than that of the radial side. Tilting of radial head in coronal plane averaged 7 degrees and in sagittal averaged 6.5 degree. The depth and sureface of the concavity of the radial head averaged 1.7mm and the curvature of radial head 28.4 mm. There were strong correlation coefficient between head diameter and thickness (r= 0.667), and between head diameter and depth of the concavity surface (r=0.661).

Conclusion: This study present a new method of morphometric measurement of proximal radius with 3-dimensional reverse engineering technique. The data was derived from Thai cadaveric bone that can be used for the design of proper size and shape of the radial head prostheses in the future. The design and manufacturing will be facilitated by these informations combining with the use of CAD-CAM technology.

Rapid Prototype Modeling of Distal Humerus: A New Method for Surgical Planning of the Corrective Osteotomy for Cubitus Varus

B Mahaisavariya, P Oris, T Tongdee, K Sitthiseripratip

Objective: The purpose of this presentation is to present the new method using computer-aided design (CAD) combined with rapid prototype modeling for preoperative planning of the corrective osteotomy for cubitus varus deformity.

Method: Two demonstrated cases of cubitus varus deformity of the elbow were included in this study. The patients underwent computerized tomographic evaluation of both the deformed elbow and the normal sides. The data from CT scan was used for 3-dimensional reverse engineering technique for computer aided design (CAD) for the 3-dimensional evaluation of the deformity to that of the normal side. The preoperative planning of the corrective osteotomy was planned on the screen by the computer program to evaluate the proper location of the osteotomy, the tilting of the plane of osteotomy cut and the correction of the rotation deformity that will be appropriate. The data can also be used to evaluate the lateral condylar prominence that will occur and the area of the opposing surfaces at the osteotomy sites in each configuration of the osteotomy that being planned for correction. After choosing the best configuration the data was sent for rapid prototype modeling for the plastic model of the deformed and the normal bone and also the choosing configuration of the osteotomy that will be used for pre-operative exercise to make surgeons more familiar to the deformed distal humerus prior to the operations. The patients then underwent corrective osteotomy following pre-operative plans as elective cases.

Results: Both patients were successfully operated as pre-operative plans with excellent post-operative outcomes in term of cosmesis and function of the elbow. The elbows were corrected to have equal carrying angle to that of the normal elbow with no diminished elbow motion after 3-months post operation. The internal fixation was already removed in both patients and the results remained excellent in both patients after 6 months follow-up.

Conclusion: This paper present a new method of

using computer-aided design combined with rapid prototype modeling in the pre-operative planning of difficult corrective osteotomy of cubitus varus deformity. This new application enables the surgeon to choose the proper configuration and location of the osteotomy that will be most appropriate to the individual patient.

Needle Biopsy Set for Bone Pathology

S Waikakul, A Assawamongkolgul, N Kojaranon

Objectives: To produce a set of needle biopsy for diagnosis in bone pathology that is strong enough for taking the tissue from the spine and long bone.

Materials and Methods: A biopsy set is produced locally and trial carried out in our clinic during 1996 to 2000. The instrument is made of stainless steel 316 L and consists of 4 pieces a sheath; a trocar; a bone cutter and a blunt stylet. The instrument has been tested to obtain the bone from porcine spines and femurs and then have been used under image intensifier guiding in 66 patients with bone lesions, 40 males and 26 females. Their age ranged between 9 to 76 years.

Results: Thirty patients had lesions at the spine (T5 to sacrum). The rest had bone lesions in the extremities including femur in 16, tibia in 12, humerus in 6, talus in 1 and radius in 1 patient. Adequade tissues were obtained for patholgoical study in 62 patients or 94 per cent and the correct diagnosis was noted in 52 patients or 79 per cent. The other patients needed rebiopsy because of inadequate tissues and questionable diagnosis. One patient who had spinal lesion had more neurolgoical deficit after biopsy and needed immediate exploration and decompression.

Conclusion: This local made needle biopsy set can be used for bone pathological study with encouraging results. Our instrument has high cost benefit.

CARDIOVASCULAR SURGERY

Modified Cox Maze Procedure for Atrial Fibrillation with Mitral Valve Disease

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Objective: To determine early term results of the modified Cox Maze procedure in mitral valve disease and atrial fibrillation (AF).

Between January and December 2000, 10 consecutive patients with AF underwent modified Cox Maze procedure with mitral valve repair in 2 and replacement in 8. The associated procedure included 3 aortic valve replacement, 1 tricuspid annuloplasty and 2 atrial septal defect closure.

There were 5 males and 5 females, with ages ranging from 19 to 52 years (mean = 38.3 years).

Preoperative-existing AF time varied from 4 to 146 months (mean = 41.1 months), and left atrial dimension varied from 4.50 to 6.89 cm (mean 5.51 cm).

We modified the Maze atriotomies to preserve the sinus node artery and used cryoablation, incision, and suture to simplify procedures.

Seven cases (70%) regained sinus rhythm and 3 cases (30%) still remained in AF.

Two of them developed cardiac tamponade, one month postoperatively, (one in sinus rhythm case and another one in AF case).

Those 3 patients who remained in AF had longer preoperative existing AF-time and larger left atrial dimension but statistically not significant (P = 0.227, and P = 0.187 respectively). There was no early or late mortality.

The pertaining results suggest that the modified Cox Maze procedure is safe and effective in patients with mitral valve disease and AF.

Surgical Treatment of Primary Spontaneous Pneumothorax: A Central Chest Hospital Experience

C Yottasurodom

Ojbective: This study assessed the surgical management for selected primary spontaneous pneumothorax from November 1994 to November 2000 at the Central Chest Hospital, Nonthaburi, Thailand.

Methods: Fifty-three patients (of whom 25 females) with a mean age of 35.9 (range 10-86) years were operated on. Indications included (1) recurrent pneumothorax (n = 34), (2) persistent pneumothorax (longer than 5 days) (n=15), (3) recurrence following procedures (n=4). Forty two and 11 patients underwent VATS and standard thoracotomy, respectively. Pleurodesis included pleurectomy

(n=25) and pleural abrasion (n=24).

Results: No postoperative deaths occurred; complication rate was 17 per cent, conversion rate was 17 per cent. Mean drainage time was 5.68 ± 4.21 days and hospital stay 11.96 ± 10.22 days. Mean follow-up was 39.49 ± 25.48 months. Overall recurrence rate was 11.32 per cent. Five year freedom of recurrence was 86 per cent.

Conclusion: Surgical treatment is a safe and reliable method to obtain quick reexpansion of the lung. Long term recurrence rate are acceptable.

Radiofrequency Ablation for Chronic Atrial Fibrillation Associated with Mitral Valve Surgery

S Asavapiyanond, S Saengchote, S Tanami

Background: Patients with a mitral valve disorder often have factors predisposing to AF, such as advanced age, cardiomegaly and increase atrial size. These factors tend to result in persisted AF even after and otherwise successful mitral valve operation. Radiofrequency (RF) ablation technique for the treatment of chronic AF remains elusive. We attempted ablation of AF in patients who underwent mitral valve procedures.

Objective: The purpose of this study was to compare the results and complications of radiofrequency ablation in patients under going concomitant mitral valve operation.

Materials and Methods: A prospective study (quasi-experimental design) was conducted in 38 patients with mitral valve surgery in Rajvithee Hospital between June and August 2000. Atrial fibrillation was chronic (over 1 year) in all patients. The patients were divided into two groups. Twenty one patients underwent mitral valve procedures with combination of direct intraoperative radiofrequency ablation in group A. Group B (17 patients) only mitral valve surgery was performed.

Results: No operative or hospital deaths was observed. There was no serious post operative complications. Both groups were demographically similar; except CPB time, aortic cross-clamp time and amount of post operative bleeding. Group A had CPB time (117.57 ± 18.96 minutes), aortic cross-clamp time (87.0 ± 15.11 minutes) and post operative bleeding (812.38 ± 377.70 ml) respectively more than group B (72.06 ± 20.51 minutes, 47.29 ± 14.76 minutes, 560.59 ± 247.85 ml). They were statistically significant. But there was no differences in number of PRC transfusion of both groups. There were post operative sinus rhythm in group A more than in group B which were statistically significant at 1 day (66.7%/35.3%), 7 days (42.9%/17.6%) and 1-6 months (47.7%/17.6%).

Conclusion: We conclude that the use of intraoperative radiofrequency catheter ablation is safe and effective for patients with chronic atrial fibrillation undergoing mitral valve operations.

Outcome of Coronary Artery Bypass Surgery in the Patients with Poor Left Ventricular Function

W Slisatkorn, C Cheanvechai, K Luengtaviboon

Background: The patients with poor left ventricular function were classified in the high operative risk group for coronary artery revascularization. The purpose of this study is to analyze the results and factors that determine the outcome in these patients.

Method: During January, 1998 to December, 2000, isolated coronary artery bypass was performed on the 52 patients with poor left ventricular function (ejection fraction < 30%), ranging in age from 41 to 80 years (mean age, 61 years). Forty seven patients were operated in the elective operations, 3 patients were in urgent procedures, and the 2 patients were in the emergency. The symptoms of congestive heart failure were found in 31 cases (59.6%). Twenty nine patients (55.8%) had history of myocardial infarction and 12 patients (23.5%) had no angina pectoris symptom.

Results: The majority of patients could come off cardio-pulmonary bypass without incidents (36 cases, 78.3%). Three patients (6.5%) required high inotropic drugs support and 7 patients (15.2%) needed intra-aortic balloon support. The mortality rate was 3.8% (2/52) while the postoperative complication rates included ventricular tachycardia (9.6%, 5/52), stroke (9.6%, 5/52), renal failure (3.8%, 2/52) and perioperative myocardial infarction (1.9%, 1/52).

Conclusions: Although the patients with poor left ventricular function had higher risks of morbidity, most of them could be operated with low mortality and had good early results.

Surgical Revascularization in Kawasaki Disease

S Sriyoschati, P Laksanabunsong, S Ponvilawan, T Phanchaipetch, T Subtaweesin, P Sakiyalak, J Soongswang, K Durongpisitkul

Kawasaki disease is a relatively common pediatric disease throughout the world. Its bacteriology and the mechanism of immune arteritis are not fully understood. The early use of gamma globulin therapy for acute disease has decreased the coronary complications to 15 per cent,

but lesions continue to occur. Surgical revascularization has proved effective for related cases of coronary aneurysm and obstruction. Two cases (4 and 6 years old) of coronary ischemia due to Kawasaki disease underwent uneventful coronary bypass graft with internal mammary artery. Repeated echocardiogram revealed improvement of LV function. Repeated coronary angiography revealed patent grafts.

Sternal Turnover with Preserved Internal Mammary Vessels and Rectus Abdominis Muscle Pedicle for the Repair of Severe Pectus Excavatum

T Phanchaipetch

Pectus excavatum or funnel chest is the most common congenital deformities of the chest wall. Surgical correction should be considered for all patients with moderate to severe deformities because of the significant cosmetic and psychological improvement, subjective increase in exercise tolerance, documented changes in the cardiac and respiratory status, and prevention of the development of scoliosis after surgical intervention in these patients.

The sternal turnover with preservation of internal mammary vessels and rectus abdominis muscle pedicle for the corrective repair of funnel chest involves resection of the deformed thoracic wall including sternum and ribs, a pedicle of rectus abdominis muscles and one internal mammary vessel pedicle with a short segement resection of the above ipsilateral costal cartilage to allow reposition of the vascular pedicle onto the presternal surface after turnover of the sternum. Multiple corrective measures and osteotomy and costoplasty usually were performed before refixing the sternum and ribs.

This modified sternal turnover technique gives better blood supply to the sternum, provides excellent result, and minimal morbidity and mortality.

Nitric Oxide Therapy in Post Operative Pulmonary Hypertensive Crisis

S Sriyoschati, U Prakanrattana, J Soongswang

Pulmonary hypertensive crisis is one of the most important causes of death in early post operative period of congenital heart diseases. Conventional therapy with intravenous medications, oxygenation, respiratory and metabolic control is insufficient for severe pulmonary hypertension. In this decade, inhale nitric oxide (iNO) is proved to be the additional therapy to salvage this group of patients. This is a report of our experience in nitric oxide therapy in 2 cases with post operative severe pulmonary hypertensive crisis.

Two infants age 8 and 6 months old were admitted with the diagnosis of truncus arteriosus type II and I by echocardiogram respectively. Pulmonary vascular resistant of 2.72 Wood unit/m^2 was obtained from cardiac catheterization in Case 1. Both patients underwent surgical correction of truncus arteriosus without complication. Within a few hours post operation both developed tachycardia, desaturation, rising CVP and mean airway pressure, hypotension and low cardiac output. Paralytic agent, sedative agent, inotropes, pulmonary vasodilator, and hyperventilation and oxygenation were given without improvement. High dose (80ppm) iNO was administered and hemodynamic parameters returned within 10 minutes. After 48 hours the dosage of iNO was gradually decreased and discontinued on day 7 post operation.

Conclusion: Severe pulmonary hypertensive crisis in acute post operative congenital heart diseases could be successfully managed with conventional means and high dose iNO. Promptly start iNO in intractable cases is necessary to save the patient and prevent long term morbidity.

Cartilaginous Hamartoma of the Chest Wall : Report of Two Cases in Infancy

H Muhamud, S Songkhathat, P Vasinanukorn, H Sriplung

Cartilaginous mesenchymoma (mesenchymal hamartoma) is a rare chest wall tumor. Although surgical resection is amenable, this benign lesion is often confused with malignant conditions. Herein, we report the disease in two infants presented with expanding lesions of the ribs.

Case I was a 6-month old male infant presented with failure to thrive of three months period. No respiratory distress was observed. Physical examination revealed slightly bulging of the upper left chest wall which was hard in consistency. The chest radiograph showed a large expansible lesion about the left 3rd to 6th ribs with discrete calcified spots. Malformed and displaced adjoining ribs superior and inferior to the lesion were also associated. Computed tomography demonstrated multiple aneurysmal cyst, measuring 6×8×10 centimetres with solid component, occupying the anterolateral aspect of the left chest wall. Majority of the mass extended into the thoracic side. Incisional biopsy revealed a benign neoplastic process. Left thoracotomy and en-bloc resection of the chest wall mass was done. Findings revealed a mixed solid-cystic mass with cartilaginous rim, originating from the fifth rib. The adjacent ribs were destroyed by compression. The cyst was

filled with old hemorrhage. The thoracic defect was substituted with a piece of Malex mesh. Histopathology disclosed chondroblast-like mesenchymal stroma with hyaline cartilaginous metaplasia. Large cavernous spaces filled with blood were similar to that in an aneurysmal bone cyst. Foci of calcification, enchondral ossification, woven bone formation and osteoclast-like giant cells were also present. The findings were consistent with chondrogenic mesenchymoma of the rib. Post operative course was uneventful and the patient did well up to six months of follow-up visit.

Case II was a two-month age male infant presented with progressive bulging of the anterior chest wall since birth. Despite normal growth and development, episodes of tachypnea was reported by his mother. Physical findings and the radiologic studies were alike case I. Core-needle biopsy reported mesenchymal hamartoma. The left posterolateral thoracotomy and en-bloc resection of the mass was done, followed by chest wall reconstruction with synthetic mesh. Diameter of the mass in this case was approximately 6 centimetres. Cut surface showed mixed cystic-solid lesion, filled with blood. Histopathological study confirmed the cartilaginous mesenchymoma. During the postoperative period, the patient had to be ventilatory assisted for 6 days, owing to unremitted hypercarbia. After discharge, the infant has been doing well on follow-up visit up 3 months.

Cartilaginous mesenchymoma is rare tumor that presents as an aneurysmal bone cyst in an infant. Pre-operative diagnosis can be confirmed by needle biopsy. Surgical resection is a curative treatment.

Infected Aneurysms Atherosclerotic Aorta

K Luengtaviboon

Background: In Thailand the incidence of mycotic aneurysms secondary to infective endocarditis is decreasing. Now the most common cause of infected aneurysms is due to bacteremia and secondary infection of the atherosclerotic aorta mostly due to Salmonella. The patients are older and chance of rupture is high.

Patients and Methods: Four patients had infected atherosclerotic aorta were the subjects of this report. All of them were male and their ages were averaging 68.3 years old at the time of operation. They presented with fever, hemoptysis, left hemothorax and purulent pericarditis. The locations of aneurysms were aortic arch in three patients and proximal descending aorta in one patient, CT scans of the chest were diagnostic. Aortography was performed in one patient. Coronary angiogram revealed stenosis of left anterior descending artery in one patient. Operations were performed via median sternotomy in three patients and left posterolateral thoracotomy in the patient with descending thoracic aneurysm. Repair of the aorta was performed under profound systemic hypothermia and circulatory arrest. Patch aortoplasty was done in three patients and tube graft replacement in the last patient. One patient also had coronary bypass grafting with saphenous vein graft.

Results: There was no complications developed after surgery in all of them. Culture of blood clots and aortic wall grew Salmonella group D in two, Pseudomonas pseudomallei in one and one patient the culture did not grow any aerobic micro organism. Antibiotics were given intravenously for a period of one month. They were discharged home without any evidence of recurrent infections. The first patient was readmitted one year later due to colonic obstruction from cancer of cecum. At time of right hemicolectomy, multiple metastases in left lobe of the liver was evident. Postoperative chemotherapy was given after bowel resection.

Conclusion: Infected atherosclerotic aorta has become more and more common because of increasing age of our population. They manifest as fever of unknown origin in old patients. Involvement of thoracic aorta is rare compared to abdominal aortic involvement. Risk of rupture of infected aortitis is high regardless of size. Early aneurysm resection with in situ graft replacement or extra-anatomical bypass is recommended.

Management of Venous Air Embolism During Resection of Tracheal Tumor

K Luengtaviboon

Background: Injury to great intra-thoracic systemic veins during spontaneous respiration can cause air embolism. The air obstructs out flow tract of right ventricle and causes cardiac arrest. Prompt recognition, repositioning the patient, aspirating air from right ventricle, and internal cardiac massage are important steps in resuscitating the patient.

Patient and Methods: A 50 years old woman had total thyroidectomy with radical neck dissection via collar and median sternotomy for advanced papillary carcinoma of thyroid gland 20 years ago. She recently presented with upper air way obstruction. Chest X-ray and CT scan of the chest revealed obstructing tumor in middle third of the trachea. Urgent operation was performed via collar and median sternotomy. Injuries to left innominate vein happened during reopening the stenum and because she

was breathing spontaneously, venous air embolism occurred. Bradycardia and cardiac arrest was recognized. The pericardium was opened, air was aspirated from main pulmonary artery. Her position was changed to left side down and head down, and aspiration of air from right ventricular apex was attempted. About 50 milliliters of air were removed from the heart. The heart then resumed contraction spontaneously. The tracheal segment containing pedunculated mass in side was resected with a tracheal segment of about 2.5 cm in length. Eng to end anastomosis of trachea was accomplished.

Results: She gained her conciousness slowly. At one week after operation she was able to communicate without motor weakness. The pathologic examination of the resected trachea showed invasion of papillary carcinoma inside the trachea. The resected margin was free of tumor.

Conclusion: Injury to intra thoracic systemic veins during spontaneous respiration can cause venous air embolism. It causes cardiac arrest due to obstruction of out flow tract of right ventricle. Repositioning the patient and aspirating air from right ventricle and pulmonary artery can reverse cardiac arrest. Control of bleeding points and controlled ventilation prevent further air embolism. Prompt management will prevent permanent cerebral damage due to brain anoxia.

Surgical Treatment of Mediastinal Tumour in Prince of Songklanagarind Univerisity

P Vasinanukorn, C Ruegkliang

A retrospective review was studied in mediastinal tumours treated in surgical unit at Prince of Songkla University Hospital in Southern Thailand from June 1982 to December 2000. The aim of this study was to determine the incidence, nature of the tumour found in various location in the mediastinum, morbidity, mortality and long term results. Due to the majority of benign lesions do not produce symptoms and not so many percentage of the population had routine chest X-ray, so the population based incidence can not be determined. The hospital based compare to case admission is probably more preferable.

During the study period of 18 years, we operated on 94 cases of mediastinal tumours; 51 males and 43 females of age ranging 6 months to 81 years old. The predominate ethnic group is 86 Thai, 4 Chinese and 4 Moslems. The tumour is benign in 85.2 per cent and malignant in 14.8 per cent. The malignant teratoma and germ cell tumour were quite common and were found 13.5 per cent of all tumour and they can be found in both anterior and middle mediastinum. The most common tumour in the anterior mediastinum were thymoma and teratoma. We found 2 cases of leiomyoma of esophagus and 5 neurogenic tumours in the posterior mediastinum.

Conclusion: By using Burkell division in the mediastinum. We report the finding of various tumour similar to many other reports. However, the incidence of germ cell tumour is slightly higher than other. Also we found that incidence in Moslem is lower than Thais because they rarely have a routime chest X-ray check up even though in some provinces in Southern Thailand the Moslem population is over 90 percents more than Thais.

Gastric Outlet Obstruction Caused by Trichobesoar

R Niramis, S Watanatittan

Objective: The aim of this study was to report a rare case with a trichobezoar in the stomach.

Materials and Methods: A 5-year-old girl developed abdominal pain with non-bilious vomiting about 3 days before admission. A round mass was palpable at the epigastrium. Past history indicated that she habitually swallowed her own hair during the previous 3 years. After complete radiological investigations had been done, surgical laparotomy was performed and revealed a large hair ball in the stomach. This mass obstructed the pyloric canal. The bezoar was removed through a gastrotomy. The stomach was closed in two layers. Postoperative course was uneventful. Since then, she completely stopped eating her hair.

Conclusion: This report was an unusual foreign body impaction in the stomach. Recurrence of this phenomenon has never been reported because the operation is probably traumatic enough to stop one from hair ingestion.