

Abstracts

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ORTHOPAEDIC SURGERY

A New Technique for Reduction of Anterior Shoulder Dislocation without Anesthesia: Gentle Traction, Abduction, and External Rotation

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Background: Anterior dislocation of the shoulder joint is a common problem in emergency room. There are several maneuvers for reduction of the dislocated joint such as Stimpson's and Magnusen's techniques including traction-countertraction, etc. The success rate of these techniques is 80-90% and they need anesthesia or narcotics. Surgeons must be careful about complications caused by anesthesia. To avoid these complications, the Department of Orthopaedic, Siriraj Hospital, has developed a new maneuvering technique for reduction of anterior dislocation of a shoulder joint without anesthesia. The maneuver consists of gentle traction, abduction, and external rotation of the shoulder joint.

Objective: To study the effectiveness of the new technique for reduction of anterior dislocation of a shoulder joint.

Setting: Between 2001-2004, forty-two patients who had sustained an anterior dislocation of the shoulder were studied. Patients were divided into two groups in a randomized controlled study. Group 1 consisted of 24 patients whose anterior dislocation of the shoulder was reduced by the new technique without anesthesia. Group 2 consisted of 18 patients whose anterior dislocation of the shoulder was reduced by traction-countertraction under anesthesia.

Results: The results showed that, in group 1, 21 patients (87.50%) had successful reduction by the new

technique alone, and 3 patients had successful reduction by the new technique under anesthesia. All dislocated shoulders of patients in group 2 were successfully reduced. There were no complications in both groups. Statistical analysis showed that there were no significant differences in the outcomes between both groups. However, the level of patients' satisfaction of the treatment of dislocation in group 1 was significantly higher than that in group 2 ($p = 0.006$).

Conclusions: The new technique for reduction of anterior shoulder dislocation by gentle traction, abduction, and external rotation without anesthesia showed no difference in effectiveness from traction-countertraction under anesthesia, whereas it provided more patients' satisfaction.

Difference in Isokinetic Strength of the Muscles Around Dominant and Nondominant Shoulders

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Background: Muscle training usually plays a part in the treatment of shoulder disorders. Clinicians traditionally predict the pre-injury strength of an injured shoulder by using the strength of the uninjured contralateral shoulder as baseline data. Isokinetic testing is a quantitative measurement of muscular performance. Peak torque is a useful variable that correlates with muscle strength.

Objective: The purpose of this study was to determine the differences in bilateral isokinetic variables of the shoulders in Thai volunteers.

Methods: Both shoulders of 39 healthy subjects (24 men, 15 women) were tested isokinetically by CONTREX-MJ dynamometer at two angular velocities (60° and 180°/sec) during abduction, adduction, flexion, extension, internal rotation, and external rotation.

Results: The peak torque of shoulder extension was the greatest, followed by adduction, flexion, abduction, internal rotation, and external rotation. There were statistical differences of the contralateral peak torque in almost every direction of shoulder muscle contraction except shoulder flexion at both speeds. The peak torque of shoulder adduction, extension, flexion, and internal rotation were greater in the dominant shoulder. The peak torque of shoulder abduction and external rotation were greater in the non-dominant shoulder.

Conclusions: We should not directly use the isokinetic strength of the uninjured contralateral shoulder as normal baseline data for the injured shoulder.

The Effect of Morphine Patient Controlled Anesthesia on Post-operative Urinary Retention

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Background: Nowadays, morphine PCA for controlling post-operative pain is widely used in orthopaedic surgery. Post-operative urinary retention of patients who had a spinal or epidural block is a common problem of post-operative care, and various factors can increase the incidence of post-operative urinary retention. In this study, we tried to find out the effect of morphine PCA on post-operative urinary retention.

Objective: To evaluate the effect of morphine PCA on post-operative urinary retention.

Methods: Eighty-five patients who had undergone an orthopaedic surgery of the lower extremity were included in this study. The patients consisted of 78 males (91.8%) and 7 females (8.2%). Eighty-three patients had a spinal block and two had an epidural block. The patients were randomized into 2 groups. Group 1 consisted of 50 patients who did not receive morphine PCA but, instead, received intramuscular morphine every 6 hours for 1 day to control post-operative pain. Group 2 consisted of 35 patients who received morphine PCA to control post-operative pain. The operative time and age of the patients between both groups were statistically analyzed, and no significant difference was found. The criteria for determining post-operative urinary retention were: 1. Patients complained of urinary pain with full bladder and needed urinary catheterization; and 2. Patients had a full bladder after 6

hours post-operatively and needed urinary catheterization. Data were recorded according to both criteria, and analyzed by using Chi-Square test statistics.

Results: The results showed that, in group 1, 22 out of 50 patients (44.0%) had urinary retention and needed urinary catheterization and, in group 2, 23 out of 35 patients (65.7%) needed it. Statistical analysis showed that the incidence of post-operative urinary retention of group 2 was significantly 1.5 times higher than that of group 1 ($\chi^2 = 3.897$, $P = 0.048$).

Conclusions: Morphine PCA for post-operative pain control can increase the incidence of post-operative urinary retention by 1.5 times.

Relevance: Surgeons should pay more attention to the problem of post-operative urinary retention in patients who receive morphine PCA for controlling post-operative pain.

The Levels of Forearm Tourniquet and Resting Position of Digits

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Objective: To determine the levels of tourniquet cuff application on forearm without digits curling up.

Background: Nowadays, a minor surgery on the hand and the wrist is usually performed under local anesthesia with tourniquet applied on the forearm. The position of the tourniquet is set to apply at distal 1/3 of the forearm where there is less soft tissue than other positions. The advantages of this position are that it is tolerated longer and is considered to be less painful as concluded in some literature. But surgeons found that this position of forearm tourniquet made it difficult to operate on the palm and the fingers because of fingers curling up due to compression of flexor tendon.

Materials and Methods: We randomized 29 healthy males age 20-27 years old and divided into 3 groups. In the first group the tourniquet was applied at proximal 1/3 of the forearm, the second group at middle 1/3 of the forearm, and the third group at distal 1/3 of the forearm. The tourniquet was applied with the pressure of 100 mmHg above each subject's systolic blood pressure. The subjects were asked to specify their levels of pain and the levels were plotted on visual analog scale. We measured the distance between the tip of the finger that was nearest to the palmar surface and the distal palmar crease to evaluate an operative field on the palm.

Results: The subjects tolerated the pain from the tourniquet at 3 positions of the cuff equally well. The digits curled up close to the palmar surface of the hand when tourniquet cuff was applied at distal 1/3 and middle 1/3 of the forearm. But at proximal 1/3 of the forearm, there was very little digits curling up and this position provided a clear field of operation on the fingers and on the palmar surface of the hand and the wrist.

Conclusions: We recommend that the level of forearm tourniquet for the operation on the hand and the wrist without digits curling up interfering with the operative field is at proximal one-third.

Push-up Exercise: Analysis of Pressure Distribution in the Palm

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Background: Push-up is one of the most popular exercises that has been used for a long time since everyone can do push-up without using any complicated device. It is good for strengthening many muscle groups such as pectoralis group, back muscle group, and scapular stabilizer muscle group. It is also one of the best strengthening exercises for the treatment of shoulder pain. Push-up not only has advantages, it also has some disadvantages. Pain in the palm and wrist pain are disturbing problems of strengthening exercises.

Objective: Analysis of pressure in the palm while doing push-up.

Materials and Methods: Ten healthy subjects who had no previous pain in the palm or hand trauma were recruited for this study. All pressures in the palm were recorded by the EMED pressure platform system (novel GmbH, Germany) and analyzed by the system's program. The pressures in the palm were categorized according to 5 areas, (thenar: P1, Lunate: P2, hypothenar: P3, metacarpal heads: P4, and fingers: P5), and recorded in 5 positions according to hand position relative to the shoulder width (10 cm. medial to shoulder; 10, 20, 30 cm. lateral to shoulder). The pressures were recorded in each of the 3 positions: 1. standby position (fully extended elbow), 2. half push-up (90 degree elbow flexion), and 3. full push-up (full elbow flexion).

Results:

Comparison of pressures in each area of the palm: The Lunate and hypothenar areas had the maximum peak pressure, total pressure, and mean pressure, while the

metacarpal heads and fingers areas had only small pressures, regardless of hands position.

Comparison of pressures in the palm in each position of hands and shoulders: In standby position, the pressure increased in the Lunate area when the length between the hands was increased. In half push-up position, the pressure increased in the hypothenar area and decreased in the Lunate and thenar areas regardless of hands position. In the position in which the length between the hands was equal to the shoulder width, the pressure in the hypothenar and fingers areas increased. In the position in which the length between the hands was less than the shoulder width, the pressure in the thenar and Lunate areas decreased significantly while the pressure in the hypothenar area increased maximally. In the position in which the length between the hands was more than the shoulder width, the pressure in the Lunate area decreased while the pressure in the thenar, hypothenar, metacarpal heads, and fingers area increased, but the increment decreased when the length between the hands was increased.

Comparison of contact areas in the palm and hands position: All contact areas in the palm decreased as push-up progressed except in the fingers and thenar areas in the extreme position (maximum length between the hands).

Conclusions: This study determined the pressure distribution of each area in the palm which can be integrated with other information and applied to individuals who need a proper strengthening exercise for upper trunk and upper extremities.

A New Method of Femoral Neck Shaft Angle Measurement by Using 3D Motion Analysis

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Introduction: Femoral neck shaft angle is commonly used in preoperative planning for osteotomy, arthroplasty or fracture fixation about the hip. Most orthopaedic decision-making is base on the routine use of an anteroposterior (AP) radiograph of the proximal femur for assessing the femoral neck shaft angle. However, there is the effect of the femoral rotation on the apparent neck shaft angle, projected on a radiograph image. The purpose of this study is to measure the variation on the projected femoral neck shaft angle as a function of femoral rotation, both internal-external rotation and flexion-extension plane, by using 3D motion analysis.

Materials and Methods: An adult dried femoral

specimen was mounted on the rotational platform. The virtual markers were placed at the center of the femoral neck, intertrochanteric line and femoral shaft in both sagittal and coronal plane. Plain radiograph in AP and lateral view were performed to confirm the position of these markers. The neck shaft angle was defined as the angle subtended at the intersection of a line drawn along the axis of the femoral neck. To define the neck axis, the center of the femoral head was determined by using concentric circle template and a line drawn perpendicular to the neck at its waist. The line connecting the mid-point of this line and the head center defined the neck axis. To define the axis of the femoral shaft, two lines perpendicular to the diaphysis of the femur were drawn. A line connecting the mid-point of these two lines was drawn to represent the axis of the femoral shaft. The specimen was rotated with constant velocity, 0° - 360° , under the detection field of six motion analysis cameras. The rotation was performed in both internal-external rotation and flexion-extension plane.

Results: The direct measurement of the cadaveric specimen neck shaft angle was 125 degrees. The femoral neck shaft angle increased to 178 degrees when the femur was external and internal rotated to 90 degrees. In flexion-extension plane, the apparent neck shaft angle decreased to 60° when the femur rotated to 90° flexion and extension.

Conclusions: By using 3D motion analysis technique, we can find relationship between femoral rotation and the projected neck shaft angle.

Accuracy of Drilling the Saw Bone with K-wire, Drill Bit, and Steinmann Pin by Free-Hand Technique

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Background: Many fractures can be treated successfully by various surgical methods. However, as the number of surgery increases, the number of complications from these surgical procedures rises. One of these complications is the complication resulting from the use of instrument to fix the bone such as an injury to the adjacent neurovascular structure from over-penetrated instrument. This complication can be avoided by carefully placing the instrument step-by-step as recommended in the AO guideline. However, many orthopaedic surgeons do not follow this guideline and do it by their own skills. The purposes of this study were to determine the accuracy of free-hand technique in utilizing various instruments and whether using a protective device to prevent over-penetration of the instrument would reduce the chance of injury to the adjacent soft tissue structures.

Methods: 40 orthopaedic residents at Siriraj Hospital were tested in this experiment. Using a 3.2 mm. drill bit, a 2.0 mm. K-wire, and Steinmann pin no. 5 with the saw bone, the residents inserted these instruments with an electric cordless driver and stopped when they felt that the instrument had penetrated through the far cortex. The distance from the tip of the instrument to the far cortex of the saw bone was measured. This procedure was repeated 3 times. Data were collected and mean values were calculated.

In the next step of experiment, the same group of orthopaedic residents measured the width of the saw bone radiographically before performing the experiment. The actual width of the saw bone was reduced by 10% because of the radiographic magnification. The residents used a protective device to prevent the instrument from over-penetrating into the saw bone by adjusting the length of the protective device from the tip of the instrument according to the x-ray measurement. This experiment was repeated 3 times, data were collected, and mean values were calculated. The results from the 2 groups in this experiment (the free-hand technique group and the protective device group) were compared statistically by using paired t-test.

Results: The mean distances for the 3.2 mm. drill bit, 2.0 mm. K-wire, and Steinmann pin no. 5 were 8.06 mm. (2.33-17.37 mm.), 5.09 mm. (1.33-11 mm.), and 4.9 mm. (0.67-12 mm.) respectively in the free-hand technique group, and the mean distances for these instruments in the protective device group were 1.42 mm. (0.33-3.33 mm.), 1.53 mm. (0.33-2.67 mm.), and 1.44 mm. (0.33-3.0 mm.) respectively. The differences were statistically significant between the 2 groups ($p < 0.001$). There were 10 out of 360 times of drilling that the protective device touched the near cortex of the saw bone before the instrument penetrated through the far cortex.

Conclusions: Our study indicates that the over-penetrated distances were longer in the free-hand technique group than in the protective device group. We recommend the use of any kind of protective device which can reduce over-penetration to prevent injury to the surrounding soft tissue.

Accuracy of Femoral Head Measurement from X-ray Radiograph in Patients Who had Closed Fracture Neck of Femur

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Background: False magnification of the X-ray radiograph was a common problem in orthopaedic practice. In

patients who had closed fracture neck of femur that should undergo an operative management such as hemiarthroplasty, we frequently used a template to estimate the size of prosthesis, but if a template was not available, we could estimate it by measurement of X-ray radiograph.

Objectives:

1. To evaluate the accuracy of measurement of femoral head from X-ray radiograph.
2. To predict the size of femoral head prosthesis by direct measurement of preoperative X-ray radiograph without the use of template.

Study Design: Prospective study.

Materials and Methods: Preoperative and postoperative radiographs of both hips of 50 patients who had closed fracture neck of femur were studied. The radiographs were measured by an investigator to determine the diameter of the femoral head. The outcome of measurement was classified into 5 categories as follows:

A = Pre-operatively measured diameter of femoral head which was measured at the level of subchondral bone.

B = Pre-operatively measured diameter of femoral head which equals to the sum of A and a half of the thickness of articular cartilage.

C = Intra-operatively measured diameter of femoral head.

D = Diameter of femoral head prosthesis.

E = Post-operatively measured diameter of femoral head prosthesis.

The data were statistically analysed to find whether B and C were different or not.

Results: In this study, the mean percentage of magnification of plain X-ray radiograph was 10.73%. The size of femoral head which was predicted from plain X-ray radiograph was not different from the size of real femoral head ($p = 0.3173$).

Conclusions: The size of femoral head prosthesis of patients with closed fracture neck of femur who undergo hemiarthroplasty can be estimated by femoral head size measurement from plain X-ray radiograph (AP-view) of the affected hip.

Comparison of Two Range-of-Motion Exercise Protocols after Primary Total Knee Replacement

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Objective: To compare 2 postoperative range-of-motion exercise protocols for knee replacement patients in terms of surgical outcomes and patient's satisfaction.

Background: Postoperative pain is one of the most

fearsome issues for patients who underwent total knee replacement (TKR). An ideal postoperative range-of-motion (ROM) exercise protocol should maximize knee motion but not at the expense of pain.

Materials and Methods: 33 patients (42 knees) who had undergone primary TKR by a single surgeon between August 2002 and April 2003 were studied. Every knee was implanted with the same posterior stabilized knee design. After surgery, 22 knees (group 1) were randomly selected to receive a ROM exercise protocol which allowed the patients to start flexing their knees on POD 3 as much as they could tolerate (no passive force by a doctor). However, on POD 7 a passive force to 90° flexion was applied to every knee that could not achieve that goal. The other 20 knees (group 2) received a protocol in which a passive force to 90° flexion was initially applied by a doctor on POD 3. Both groups had the same type of anesthesia and postoperative pain control. Patients in both groups were evaluated for (1) their surgical outcomes using ROM and Knee Society knee scores, and (2) their satisfaction using SF-12 questionnaires and additional questions. Evaluations were done twice at 1 month and 3 months after surgery.

Results: At 1 month after surgery, the average ROM and knee scores in group 1 were 129.09° flexion and 90.81, respectively. In group 2, the average ROM and knee scores were 126.5° flexion and 90.30, respectively ($p > 0.05$). No significant difference was found between both groups at 3-month follow-up either. Our results also showed no significant difference in preoperative ROM and knee scores between both groups nor was there any difference in patient's satisfaction at 1-month and 3-month follow-up.

Conclusions: We concluded that applying an early passive force to 90° flexion on POD 3 yielded neither better outcomes nor patient's satisfaction. In vulnerable patients, therefore, the surgeon could opt to wait until POD 7 before applying passive ROM up to 90° flexion without compromising the surgical outcomes.

Femoral Head and Talar Dome Articular Surface: Comparison of the Quantities of Subchondral Plate

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Background: It was believed that subchondral plate thickness influenced the stability of articular surface. Collapse of articular surface in AVN was initiated by destruction of subchondral plate and trabeculae. Collapse of femoral head was found more often than that of other

articular surfaces. It was our hypothesis that the quantity of subchondral plate and trabeculae of femoral head may be different from that of other articular surfaces.

Objective: To compare the quantity (thickness and density) of subchondral plate and trabeculae of femoral head with that of talar dome.

Methods: Both femoral heads and domes of talus were harvested from 12 cadavers (between 30-50 years of age). Weight-bearing areas of both kinds of specimen were randomly selected for routine histology. Microscopy was used to measure subchondral plate thickness and trabeculae density.

Results: Mean subchondral plate thickness of talar dome was significantly thicker and mean subchondral plate density of talar dome was significantly higher than those of femoral head.

Conclusions: From our results, we found that subchondral plate thickness of femoral head was thinner than that of talar dome and subchondral plate density of femoral head was lower than that of talar dome. The low quantity of subchondral plate of femoral head might be the reason why collapse of femoral head occurred more often than that of other articular surfaces. The quantity of subchondral plate and trabeculae was one of many factors which contributed to articular collapse.

How Much can Plantar Flexion of Ankle be Immobilized with the Least Skin Problems

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Objective: To determine the degree of plantar flexion of ankle joint that does not create excessive crease and depth of skin coverage over tendoachillis tendon.

Background: Immobilization of ankle in plantar flexion is necessary for postoperative surgery of ankle such as repairing of tendoachillis tendon. Too much plantar flexion of ankle causes several complications of skin coverage over tendoachillis tendon including delayed wound healing, wound dehiscence, skin necrosis and infection. Excessive crease and depth of the skin are caused by high degree of ankle plantar flexion.

Materials and Methods: Forty-four volunteers, age ranging from 15-47 years old, consisting of 7 females and 37 males were studied. Body weight, height, circumference of ankle, and skin fat thickness were recorded. The volunteers lay prone on a table with both ankles protruding outside. Longitudinal axes of the foot and the leg were determined

by the fifth metatarsal shaft and fibular shaft respectively. Full plantar flexion of the right ankle was done and the angle was measured, whereas the left ankle was left free. Then, the degree of plantar flexion was decreased until the skin coverage over tendoachillis tendon appeared to be similar to the skin crease of the left ankle and the degree of plantar flexion (appropriate ankle) was measured. Plantar flexion of the left ankle was measured in the same manner.

Results: An average appropriate plantar flexion of the right ankle was 128 degrees (SD 8) and that of the left ankle was 122 degrees (SD 6). The degree of appropriate plantar flexion angle was directly related to full plantar flexion. Sex, body weight, height, circumference of ankle, and skin fat thickness were not related to the appropriate and full plantar flexion of both sides of ankles except skin fat thickness of the right ankle was inversely related to the degree of full and appropriate plantar flexion.

Conclusions: When ankle is immobilized in plantar flexion, we recommend that the appropriate angle should be 122-128 degrees in order to minimize problems of skin coverage over tendoachillis tendon.

Measurement of Roof-Arc Angles with Simulated Fracture of Cadaveric Acetabulum

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Background: Unreduced fracture crossing the weight-bearing dome of the acetabulum could lead to arthritis. Thus, the integrity of the weight-bearing dome is considered to be an important prognostic indicator for the outcome of acetabular fracture. The decision to operate is based on the location of the fracture relative to the weight-bearing dome. A displaced fracture crossing the weight-bearing dome is an indication for surgery.

Objective: To measure the medial, anterior, and posterior roof-arc angles which cross the weight-bearing dome.

Methods: 20 cadaveric hip joints were dissected and simulations of transverse fracture of acetabulum through juxtatectal point which corresponded to weight-bearing dome were made. All specimens were supported by foam which substituted for tissue at the buttock. Radiographic examinations were done in three views: AP, obturator oblique, and iliac oblique, before and after the removal of femoral heads. Roof-arc angles were measured in these three views which corresponded to medial, anterior, and posterior roof-arc angles. Roof-arc angles were measured by drawing a vertical line through the rotational center of

the acetabulum and a second line through the rotational center of acetabulum to the point where the fracture crossed the radiographic dome.

Results: The medial roof-arc angle was 46° (range 30° - 54°), the anterior roof-arc angle was 54° (range 40° - 61°), and the posterior roof-arc angle was 61° (range 44° - 80°).

Conclusions: The displaced fracture of the acetabulum with the medial roof-arc angle of less than 46° , the anterior roof-arc angle of less than 54° , or the posterior roof-arc angle of less than 61° crossed the weight-bearing portion; therefore, operative treatment should be considered in this group of fractures.

Measurement of the Acetabular Diameter of Cadaver Pelvic Radiographs in Comparison with Direct Measurement

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Background: In the surgical procedure of the acetabulum, especially in the total hip arthroplasty, it is necessary to evaluate the diameter of the acetabulum as a part of preoperative planning, but usually the measurement of the acetabular diameter from the anteroposterior view of the pelvic radiograph gives an inaccurate value.

Objective: To determine that which view, among anteroposterior, iliac oblique, and obturator oblique view of the pelvic radiographs gives the most accurate measurement of the acetabular diameter in comparison with direct measurement.

Materials and Methods: The study was performed on 10 cadavers: 5 males and 5 females with the mean age of 69.7 years (range: 42-86 years). 20 hips were studied by taking radiographs from 3 positions: anteroposterior, 45° iliac oblique, and 45° obturator oblique view. The cadaver pelvis was placed on a 5 cm.-thick foam to substitute for soft tissue thickness while taking the radiographs. The direct measurement of the acetabular diameter in the cadaver and the measurements from all views of pelvic radiographs were accomplished by using a Vernier caliper. The landmark measured was in the direction of the anterior superior iliac spine to the ischial tuberosity. The Intraobserver and interobserver reliability of all methods were determined by performing 3 measurements by 3 doctors. Each observer measured each radiograph for 3 times with an interval of 2 weeks between each measurement.

Results: The mean diameter of the acetabulum measured directly from the cadaver was 46.13 mm. (3.67 mm., while those measured from the pelvic radiographs in

the anteroposterior, iliac oblique, and obturator oblique view were 54.29 ± 3.67 , 47.63 ± 2.85 , and 57.29 ± 4.34 mm, respectively. The iliac oblique view gave the most accurate value with 3.36% magnification, while the magnification of anteroposterior and obturator oblique view was 17.81% and 24.30% respectively. The diameter measured from the iliac oblique view was not statistically different from that obtained from direct measurement, while the diameters measured from the anteroposterior and obturator oblique view were statistically different (p-value <0.001) from that obtained from direct measurement. The intraobserver and interobserver reliability of the 3 observers showed excellent correlations (p-value <0.0001).

Conclusions: From our study, the iliac oblique view of the pelvic radiograph provided the most accurate measurement value in comparison with direct measurement.

Relevance: The iliac oblique view is the best view of the pelvic radiograph for measuring the acetabular diameter as a part of preoperative planning for hip arthroplasty.

Patellar Thickness in Patients undergoing Total Knee Arthroplasty

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Background: The process of patellar resurfacing during total knee arthroplasty involves measuring patellar thickness. The inappropriate amount of patellar thickness is a major cause of disability after total knee arthroplasty. The average patellar thickness in Singaporean men was 24.0 mm, in Singaporean women was 21.9 mm, and in Taiwanese was 21.2 mm. The optimal residual patellar bone thickness can be constructed by, firstly, measuring the patellar bone thickness accurately.

Purpose of this Study: To assess the average patellar thickness in patients undergoing total knee arthroplasty in Thai population.

Study Design: Descriptive prospective study.

Materials and Methods: The subjects were 136 patients (150 knees) with knee osteoarthritis who were undergoing total knee arthroplasty at Siriraj Hospital between January 2003 and September 2003. 120 patients were male, 16 patients were female, and 14 patients had a bilateral procedure. The standard method of measuring patellar thickness by using standard caliper was performed on all patients.

Results: The average age of the patients was 68 years old. The average patellar thickness in male was 24.0 mm, in female was 21.6 mm, and overall was 21.9 mm.

Conclusions: The average patellar thickness in Thai patients undergoing total knee arthroplasty was 24.0 mm. in male and 21.6 mm. in female. This knowledge may lead to fewer postoperative fracture complication of patellar which is a result of bone deficiency due to excessive resection.

Prognostic Factors after Proximal Tibial Valgus Osteotomy in Infantile Tibia Vara

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Objectives: 1. To find the prognostic factors affecting the outcomes after proximal tibial valgus osteotomy in infantile tibia vara. 2. To study the significance of affected knee arthrography during surgery.

Materials and Methods: Between 1994-2003, because of low compliance of bracing, 2 boys and 11 girls with infantile tibia vara were surgically treated, after their parents' informed consent, by domed shape proximal tibial valgus osteotomy. 19 legs were treated including bilateral involvement in 6 cases (1 boy and 5 girls). After surgery and removal of the cast, the children were followed-up closely. They were divided into 2 groups. Group A showed no deformity after one surgery. Group B with recurrence of varus deformity required another corrective osteotomy. The prognostic variables were studied and compared between both groups. These were age, sex, side, weight in percentile, Langenskiold stage of diseases, tibiofemoral angle (TFA), metaphyseal diaphyseal angle (MDA), and medial physeal slope (MPS). An arthrographic study was done and the following quantities were measured: articulodiaphyseal angle (ADA), articulomedial physeal angle (AMPA), and ratio of medial epiphyseal thickness/lateral epiphyseal thickness (RMLT).

Results: There were 10 legs in group A and 9 legs in group B (average of 2.4 operations). In all cases, the children healed with good alignment of the legs without major complication. There was no statistically significant difference between the two groups ($p > 0.05$) in sex, side, weight percentile, MDA, TFA, AMPA, and RMLT. There were prognostic factors which produced statistically significant differences between the two groups ($p < 0.05$). These were: 1. Age less than 3 years old, 2. Langenskiold stage of diseases less than 3, 3. MPS angle less than 60 degrees, 4. ADA varus less than 18 degrees preoperatively and valgus more than 13 degrees postoperatively. The arthrographic study showed delay in maturity of medial epiphysis because of the children's obesity and the study helped in achieving a better result from corrective osteotomy

during surgery.

Conclusions: The prognostic factors and the usefulness of arthrography were identified. Better results could occur in children who meet these prognostic factors. Because of a high failure rate in brace treatment in Thai children and poor outcomes from delayed surgery, the authors suggest that surgery should be performed immediately in Thai children who have infantile tibia vara with one of these indications: 1. More than 2 years of age at the time of diagnosis, 2. Langenskiold stage 2 or more at the time of diagnosis, 3. 3 years of age in children who received brace treatment for some period of time but deformity persisted.

Properties of Bone Cement in Hand-Made Vacuum Mixing Technique

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Background: The technique of vacuum mixing of polymethylmethacrylate of bone cement (PMMA) is now widely used in orthopaedic surgery because it can provide more strength in the construct of PMMA including compressive strength increment and porosity reduction. The cost of a commercial vacuum mixing device is still high (approximately 100 USD). When we considered the cost-benefit aspect of such a device which was used for only 2 minutes at a time, we thought that the expense was too high for our patients; therefore, we have invented a new technique which can lower the cost.

Research Question: Can our hand-made vacuum mixing technique create more strength in bone cement?

Materials and Methods: We have investigated Palacos[®] cement in both vacuum and conventional mixing techniques. A container of total knee prosthesis was adapted to be a hand-made vacuum mixing instrument. The vacuum pressure was set at 600 mmHg. The compressive strength of each set of 30 specimens made by vacuum and conventional mixing technique was measured by an Instron mechanical testing machine. Statistical analysis was done using student's t-test.

Results: We have found that bone cement made by hand-made vacuum mixing technique had more yield strength ($P = 0.005$), ultimate strength ($P < 0.001$), and stiffness ($P < 0.001$) than that made by conventional mixing technique.

Conclusions: Since our hand-made vacuum mixing technique can create more bone cement strength, we can apply this technique for daily usage of most of the joint

replacement procedures which require bone cement for fixation in Thailand. This means that we can save up to 100 USD for our patients in each application.

Effect of Freezing on Physical Property of Fascia

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Aims of Investigation: To find out the effect of deep-freezing that is usually used in our tissue banking on changing of length and strength of fascia lata, the study has been carried out.

Material and Methods: Fifty pieces of porcine fascia lata, 3 cm in width and 10 cm in length, were used for the study. They were randomly divided into 5 groups with 10 fascias in each group; group I fresh fascias, group II frozen fascias that were fixed on a wooden board at the initial length to maintain the initial length with 3 month deep-freezing, group III one month deep-freezing without fixation at the initial length, group IV two month deep-freezing without fixation at the initial length and group V three month deep-freezing without fixation at the initial length. All were re-measured by Mitutiyo vernier caliper to find out changing of their length. Every fascia was then subjected to a single tensile load until failure by Shimutzu AGB 2000 at 1 cm/sec. The ultimate strength of each fascia was recorded. Data were analyzed using Student-T-test.

Results: There were no significant different in length and ultimate tensile strength that varied between 57.4 and 72.4 Kg among the groups.

Conclusions: Our process of soft tissue preservation and deep-frozen have no significant effect on the length and tensile strength of the tissue.

Reliability Assessment of Metaphyseal-Diaphyseal Angle Measurement in Children

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Objective: To assess the reliability of Metaphyseal-Diaphyseal angle measurement by two techniques.

Materials and Methods: The radiographic examination of 22 patients with genu varum, 2 males and 20 females, were included in this study. The inclusion criteria were normal children or infantile tibia vara with less than 4 years of age. Children who had undergone previous surgical treatment of tibia or femur and those of more than 4 years of age were excluded from this study. The anteroposterior x-ray radiograph of the leg was used to

measure the Metaphyseal-Diaphyseal angle of tibia (TMDA) and femur (FMDA) by two techniques. In the first technique, the angle between the line perpendicular to the lateral cortex and the line between the breakage of distal femur or proximal tibia (MDA) was measured. In the other technique, the angle between the line perpendicular to the anatomical axis and the line between the breakage was measured. The angle in each x-ray radiograph was measured twice and repeated again at 3-week interval by randomly selected residents. Statistical analysis was performed by using paired t-test with significant difference at ($\alpha = 0.05$) and by using intraclass correlation to determine intraobserver and interobserver reliability of each technique.

Results: There was no significant difference in the intraobserver group between the two techniques for measuring MDA of tibia or femur and tibio-femoral angle ($p > 0.05$). However, the intraobserver and interobserver reliability of TMDA and FMDA which were measured by using the line perpendicular to lateral cortex were better than those using the anatomical axis.

Conclusions: The assessment of TMDA, FMDA, and TFA by using the lateral cortex technique is more reliable than those using the anatomical axis. The measurement using the lateral cortex is useful for predicting and following-up in infantile tibia vara.

A Comparative Study of Tensile Strength between No. 1 Dexon, No. 1 Safil, and No. 5 Ethibond

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Objective: To compare the tensile strength between 1. Absorbable no. 1 Dexon and non-absorbable no. 5 Ethibond. 2. Absorbable no. 1 Safil and non-absorbable no. 5 Ethibond.

Design: Experimental study

Background: The use of no. 5 Ethibond as a suture material was necessary for pulling bone-patellar bone graft for anterior cruciate ligament reconstruction, but the cost of no. 5 Ethibond was high. To reduce cost, other cheaper suture materials such as no. 1 Dexon and no. 1 Safil were used as substitutes for no. 5 Ethibond. Their usefulness was confirmed by tensile strength testing.

Material and Methods: A universal testing machine, Shimadzu AG 2000 was used. The lower grip of the machine was designed to use two loops of material with 10 mm. distance between the loops which is similar to that used in the technique of pulling bone-patellar bone graft in anterior cruciate ligament reconstruction. The upper grip

was designed to use one loop similar to the pulling of suture material by a surgeon's hand. The distance between the upper and lower grip was 150 mm. Two loops of no. 1 Dexon were used to connect the upper and lower grip. The tensile strength of no. 1 Dexon was measured by applying a tensile force with the speed of 10 mm./min. until the material was broken. The tensile strength of no. 1 Safil and no. 5 Ethibond were measured similarly, but for the no. 5 Ethibond, only one loop of material was used to connect the upper and lower grip. The data of these three kinds of material were analysed by paired t-test.

Results: The average tensile strength of no.1 Dexon was 78.88 kgf (SD 4.91), that of no. 1 Safil was 85.38 kgf (SD 4.35), whereas that of no. 5 Ethibond was 65.57 kgf (SD 4.35). Statistical analysis showed that the tensile strength of no. 1 Dexon and no. 1 Safil were significantly stronger than no. 5 Ethibond ($P < 0.001$).

Conclusions: Two loops of no. 1 Dexon or no. 1 Safil are stronger than one loop of no. 5 Ethibond.

Relevance: Two loops of no. 1 Dexon or no. 1 Safil can be substituted for one loop of no.5 Ethibond in pulling bone-patellar bone graft for anterior cruciate ligament reconstruction.

Effectiveness of a Bladder Training Program for urination of Patients Who Underwent Knee Ligament Surgery

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Objective: To compare the effectiveness of a bladder training program with that of natural voiding.

Design: Randomized control study.

Background: Postoperative urination is a problem for a patient who has undergone knee ligament surgery under epidural or spinal block. Many patients need urinary catheterization. In order to reduce the patients' urination problem, a bladder training program was introduced.

Material and Methods: The bladder training program included familiarising the patients with the environment and urinary vessel, advice on the patients' position, and application of cold temperature (cold pack) at anterior lower abdomen. This study involved an 8-hour period postoperation of 80 patients who underwent knee ligament surgery under epidural or spinal block. The patients were selected randomly and divided into two groups. In Group I, the patients voided naturally. In Group II, the patients were trained in the bladder training program. Successful urination and unsuccessful urination which needed urinary catheterization were recorded. Data was analysed by t-test.

Results: In Group I, 20 patients (57%) voided successfully and 15 patients (43%) needed urinary catheterization. In Group II, 26 patients (57%) voided successfully and 19 patients (43) needed urinary catheterization. Statistical analysis showed no significant difference in urination between both groups.

Conclusions: Urination of the patients who were trained in the bladder training program was not more effective than natural voiding.

Relevance: In order to reduce nurses' workload, a bladder training program should not be introduced for postoperative urination.

Effectiveness of a Modified Bladder Training Program for Urination of Patients Who Underwent Knee Ligament Surgery

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Objective: To evaluate the effectiveness of a modified bladder training program.

Design: Randomized control study.

Background: A bladder training program had been introduced to patients who underwent knee ligament surgery. It consisted of advice for the patients to familiarize themselves with the environment and the urinary container, advice on a comfortable position and stimulation of urination by cold temperature. The effectiveness of the program was not different from that of allowing the patients to void naturally. In order to increase the effectiveness of urination in postoperative knee ligament surgery patient, a modification of the old bladder training program was done by adding abdominal muscle training, massage, application of warm temperature at lower anterior abdominal wall, and forced voiding by voluntary contraction of abdominal muscles, sometimes in combination with coughing.

Material and Methods: 75 patients, 10 females and 65 males from 18 to 45 years old, who had undergone knee ligament surgery were included in this study. The types of anesthesia used with the patients included 50 spinal blocks and 25 epidural blocks. The study involved an 8-hour period postoperation. The patients were randomly selected and divided into two groups. Group I consisted of 35 patients who voided naturally. Group II consisted of 40 patients who were trained in the modified bladder training program. Successful urination by the patients themselves and unsuccessful urination which needed catheterization were recorded. The data from both groups were analysed

by t-test.

Results: In Group I, 20 patients (57%) voided successfully by themselves and 15 patients (43%) needed urinary catheterization. In Group II, 23 patients (57.5%) voided successfully by themselves and 17 patients (42.5%) needed urinary catheterization. Statistical analysis showed that there was no significant difference between both groups ($P = 0.58$).

Conclusions: The effectiveness of the modified bladder training program was not different from that of natural urination within 8 hours of postoperative knee surgery under epidural or spinal block.

Relevance: The modified bladder training program should not be introduced to reduce the nurses' workload.

Effectiveness of a Newly Designed Foot Supporting Instrument Used during Total Knee Arthroplasty Surgery

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Objective: To evaluate the effectiveness of a new foot supporting instrument used during total knee replacement surgery.

Design: Descriptive study.

Background: During total knee arthroplasty surgery, an assistant surgeon needed to use one hand to maintain the patient's knee position in flexion, stabilizing the foot on the operative table. To reduce the workload of the assistant surgeon, a new foot supporting instrument was designed to stabilize the foot in order to flex the knee during total knee arthroplasty.

Material and Methods: A newly designed foot supporting instrument was made of an L-shape metal rod. The diameter of the rod was 1/2 inch and the length of both limbs of the L-shape rod is 12 inches. One limb of the L-shape rod was covered with leather and soft rubber to support the plantar surface of the foot. The other limb was firmly connected to the side of the operative table which corresponded to the left or right knee to be operated on. From August 2003 to September 2003, this newly designed foot supporting instrument was used in 20 patients who were undergoing total knee replacement surgery. Each surgery was done by 3 surgeons: a surgeon, a first assistant surgeon, and a second assistant surgeon. This study included the satisfaction of the surgeons and the effectiveness of the instrument in maintaining knee flexion during surgery. Scores were given according to the results. Given scores were graded into 4 levels: excellent is between 3.5 to 4, good is between 2.3 to 3.4, satisfactory is between 1.5 to 2.4, and

poor is less than 1.5.

Results: The average score for reduction of surgeons' workload was 3.90 ($SD = 0.30$), for convenience during surgery was 3.88 ($SD = 0.32$), for safety was 3.90 ($SD = 0.30$), for usefulness was 3.90 ($SD = 0.30$), and for surgeons' satisfaction was 3.93 ($SD = 0.25$). All the scores evaluated were in the excellent grade.

Conclusions: The effectiveness of the newly designed foot supporting instrument for total knee arthroplasty surgery was excellent.

Relevance: The newly designed foot supporting instrument should be used to reduce the workload of surgeons and provide convenience during total knee arthroplasty surgery.

Effectiveness of Boonsom's Retractor and Zen's Retractor in Minor Surgery

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Objective: To compare the effectiveness of Boonsom's retractor with Zen's retractor.

Design: Randomized control study.

Background: In minor surgery, Zen's retractor is used to provide exposure and clear operative field such as the use in decompression of De Quervian's disease, trigger finger, and excision of carpal ganglion, but the cost of Zen's retractor is high. To reduce cost, Boonsom's retractor was designed and produced.

Material and Methods: Boonsom's retractor was produced by using a 3.2 mm. diameter Steiman pin. Both ends were constructed to have a 90-degree bend like an "L" and a blade shape. The blade shape of one end was 15 mm. long, 2.5 mm. wide and 1.5 mm. thick. The blade shape of the other end was 10 mm. long, 2 mm. wide and 1.5 mm. thick. The effectiveness of Boonsom's retractor and Zen's retractor in minor surgery were studied by using randomized control. The study included safety, ability to maintain exposure of operative field, satisfaction of the surgeons, ease of maintenance and cost. 60 patients undergoing minor surgery including decompression De Quervian's disease, trigger finger, and excision of small mass were divided into 2 groups and studied. In Group I, consisted of 32 patients, Boonsom's retractor was used. In Group II, consisted of 28 patients, Zen's retractor was used.

Results: Boonsom's retractor provided good exposure of operative field, safety, ease of maintenance, and surgeons' satisfaction similar to Zen's retractor, but Boonsom's retractor is 10 times cheaper than Zen's

retractor.

Conclusions: Boonsom's retractor is cheaper and provides the same convenience during minor surgery as Zen's retractor.

Relevance: Boonsom's retractor should be used in minor surgery, replacing Zen's retractor, to reduce cost of surgical instrument.

Results of a Preoperative Care Technique by Using Telephone

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Objective: To evaluate the results of a preoperative care technique by using telephone

Design: Descriptive study

Background: The heavy workload in Orthopaedic outpatient service unit and limited time for explanation of the disease process, steps of operation, and preoperative and postoperative preparations to the orthopaedic patients who had appointments for surgery had led to the patients' misunderstanding and loss of appointments. In order to reduce these problems, a preoperative care technique by using telephone was designed to improve the patients' understanding and reduce the number of lost appointments for surgery.

Material and Methods: From April 2003 to September 2003, by using telephone for communication, 120 patients who had appointments for surgery (or their relatives) were studied by the orthopaedic follow-up service unit. The study included the introduction of the follow-up service unit of the Orthopaedic Department, and the primary interview about the knowledge of the disease and steps taken before and after operation. A pre-test of 10 multiple-choice questions was given to the patients (or their relatives) and wrong answers were corrected. Two days before the operation, the patients or the patients' relatives were contacted by telephone and the same interview and the same 10 questions were asked as in the previous contacts. The pre-test score, post-test score, and the number of patients who had lost their appointments for surgery were recorded and compared with those in the same period of last year. Data was analysed by paired simple test.

Results: The average pre-test score was 4.34 and the average post-test score was 8.33. This showed that the patients or the patients' relatives had improved their knowledge and understanding ($P < 0.001$). No patient lost an appointment for surgery compared to 23 out of 42 patients lost their appointments for surgery in the same period last year. Statistical analysis showed that there was

a significant difference ($P < 0.001$).

Conclusions: The pre-operative care technique by using telephone can improve the knowledge and understanding of the patients and the patients' relatives and can reduce the number of loss of appointments for surgery significantly.

Relevance: The preoperative care technique by using telephone should be included in the outpatient department to increase the effectiveness of the service.

Satisfaction of the Patients and their Relatives During Admission in the Orthopaedic Private Ward, Siriraj Hospital

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Objective: To find out about the patients' and their relatives' satisfaction during admission for surgery at Orthopaedic private ward in Siriraj Hospital.

Design: Descriptive study.

Background: Quality of service is a part of hospital accreditation. To improve the quality of service, we must study not only of the patient's satisfaction but of the relatives also.

Material and Methods: 64 patients who were admitted in Orthopaedic private ward and 36 relatives were included in this study. The patients were divided into 4 groups. 23 patients were in the knee surgery group, 13 patients were in the back surgery group, 7 patients were in the hip surgery group, and 15 patients were in the other-kind-of surgery group. The average admission period was 7 days (5-10). The average hospital stay of their relatives was 5 days (3-7).

Results: The result of this study showed that, preoperatively, the patients' satisfaction of the humanity of and their relationship with the doctors and nurses was 100%, of the cost of treatment was 98%, of the details of treatment was 86%, and of the admission process was 80%. Postoperatively, the patients' satisfaction of the humanity of and their relationship with the doctors and nurses was 100%, of the cost of treatment was 98%, of the service was 97%, of the results of treatment was 95%, of the details of treatment was 94%, and of the admission process was 92%. Where as for the patient's relatives, their satisfaction of the cost of treatment was 100% preoperatively and 97% postoperatively.

Conclusions: The order of the patients' satisfaction was the humanity of and their relationship with the doctors and nurses, the cost of treatment, and the service, respectively. For the patients' relatives, they were satisfied with the service, the humanity of and their relationship with the doctors and nurses, and the cost of treatment.

Relevance: This study led to an improvement of quality of service in Orthopaedic ward, Siriraj Hospital.

The Cost of Care During Hospitalization of Spinal Cord Injury Patients at Siriraj Spinal Unit

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The Spinal Unit of Siriraj Hospital, Mahidol University in Bangkok was established in 1995 as the first spinal injury unit in the Kingdom of Thailand. We had evaluated the cost of hospitalization for the care and treatment of spinal injuries in this unit. Costs of care were calculated for all 82 acute spinal injury patients admitted at Siriraj Spinal Unit between January 1999 and December 2000. The data were compiled from the summary of expenditure record. The patients were predominantly male (73.2%). The age range was from 15 to 90 years old (mean = 37.38 years) and 39% were employed. Hospital stays averaged at 76.77 days (range from 2 to 260). Hospitalization costs totaled at 10,555,765 Baht (approximately 251,327 US dollars) for all 82 patients and increased with the severity of injury with an average of 216,865.25 Baht (5,163 US dollars) per patient for cases of complete neurological deficit, 50,922.91 Baht (1,212 US dollars) for those of lesions, and 37,346.63 Baht (889 US dollars) for those without neurological deficit. The largest proportion of the cost was for room board (including private rooms) at 2,959,550 Baht (70,465 US dollars), followed by 1,528,686 Baht (36,397 US dollars) for medication, and 1,078,200 Baht (25,671 US dollars) for ventilator support.

Infrared Surface Thermometer for Measuring Skin Temperature

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Aims of Investigation: To find out the possibility to use TPI 370 infrared surface thermometer to detect skin temperature under normal condition and ischaemic condition.

Materials and Methods: The thermometer was used in measuring skin temperature at the tips of every digit in 95 volunteers and the room temperature at the time was also recorded. Changing of skin temperature of the index tip under ischaemic condition by applying tourniquet at the proximal phalanx of the index was measured every minute for 5 minutes comparing to the control index to determine the effect of ischaemia. Changing of skin temperature more than 2 degrees Celsius was recorded. The measurement was carried out 3 times at each step and mean temperatures were calculated.

Results: Room temperature that varied between 29.5 and 34.2 degrees Celsius has little effect on skin temperature of every digit that varied between 33.4 and 35.7 degrees Celsius. Within 5 minutes after ischaemic condition was applied at the proximal phalanx, skin temperature of the ischaemic index tips became lower than the control sites at least 2 degrees Celsius in 7/35 digits (17.1%).

Conclusions: Infrared surface thermometer, TPI 370, is an interesting tool for measuring skin temperature in normal and ischemic condition. It is now trailed in the clinic.

A Local Made Metal Detector

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Aims of Investigation: To find out the efficacy and the distant that our local made metal detector could detect the implanted metal in the bone and soft tissue.

Materials and Methods: Our metal detector was used to identify a stainless steel pin, 0.5 mm in diameter and 0.5 cm in length and a small screw, 3.5 mm in diameter and 5 mm in length in porcine femoral condyles and back muscle at different depth between 1.0 to 30.0 mm. A pin or a screw was placed at a time in the position at the exact depth that determined by Sumitoyo vernier caliper. The metal detector was used to detect the implant 3 times at each depth and the results must be similar. When the pin or the screw was identified, the analog swung to the left and the red light sign came out.

Results: Our metal detector could detect the pin in the bone at <5.0 mm depth and in the muscle at <10.0 mm depth.

Conclusions: Our metal detector that can be sterilized by autoclaving can detect the pin at useful distances both in the bone and soft tissues. It is a reliable tool for metal detection and will be further studied in the clinic.

PEDIATRIC SURGERY

The Comparison of Frenulotomy with Conventional Frenuloplasty in the Management of Breastfeeding Difficulty: A Randomized Controlled Trial

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Background: Tongue-tie is a congenital underdevelopment of the lingual frenulum and it results in decreased tongue tip mobility. Tongue-tie that is related to breastfeeding difficulty determined benefits for surgical correction. The conventional frenuloplasty was performed in necessity of general anesthesia, although with satisfied results, the risk for anesthesia was still questioned. The less invasive procedure was intended to be performed.

Objective: To prove the efficacy of frenulotomy under local anesthesia in solving breastfeeding problems due to tongue-tie in the neonate compare with frenuloplasty under general anesthesia.

Materials and Methods: A randomized controlled study was conducted. All newborn in lactation clinic that had tongue-tie as the major cause of breastfeeding difficulty were randomized into two groups. Pre and post operative LATCH score was evaluated. The increment of LATCH score indicated improvement in breastfeeding efficacy.

Results: From October 2002 to January 2003, 30 newborns were enrolled in this study. Mean increased score in frenuloplasty group was 3.07 and in frenulotomy group was 3.13. There was no difference in increased LATCH score in both operations. No surgical complication was found in this study.

Conclusion: Frenulotomy under local anesthesia is safe and effective procedure for solving breastfeeding problems in neonate due to tongue-tie.

Pediatric Trauma: One Year Experience at Maharaj Nakorn Sri Thammarat Hospital

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Objectives: To review one year experience in the treatment of traumatic child at Maharaj Nakorn Sri Thammarat hospital

Materials and Methods: All medical records of the traumatic child admitted at Maharaj Nakorn Sri Thammarat Hospital from 1 June 2003 to 31 May 2004 and treated by the pediatric surgeon were reviewed.

Results: Two hundred and thirty-two traumatic patients were treated by the pediatric surgeon. There were 118 boys and 114 girls with age ranging from 1 month to 14 years old. The highest incidence was found in March. Most mechanism of injury was blunt trauma and the most common cause was due to motorcycle passenger accident (33.2%). The central nervous system was the most common injured system (62.1%). Thirty-six patients (15.5%) had multiple organ injuries. Management consisted of neurological observation, conservative treatment and operative treatment in 59.9%, 10.3% and 29.7% respectively. The mortality rate was 3.9% and 6 patients (2.6%) had permanent disabilities.

Conclusions: A high incidence of the traumatic child was found in Nakorn Sri Thammarat. One third of the patients were motorcycle passengers. About two thirds of the patients had a central nervous system injury and the most common treatment was neurological observation. The mortality rate and morbidity were still high. Thus, an intensive preventive program must be used. The pediatric surgeon has a major role in the management of the traumatic child.

Modes of Student Transportation and Risk of Traffic Injury in Bangkok

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Problems: Traffic injury is a common problem in children, so are the social problems associated with traffic jams. Presently, no available data has been addressed concerning the safety of various modes of student transportation in Bangkok.

Objectives: To identify modes of student transportation and compare the risk of traffic accidents and traffic injuries among modes of transportation.

Setting: One hundred and thirty-seven schools under one department of BMA and three departments of Ministry of Education in Bangkok Metropolis were selected by using multistage stratified random sampling. The estimated sample size was 17,772 students. Between March 2003 and February 2004, completely self-administrated questionnaires from 17,499 students and also their parents in 134

schools were obtained. In addition, 129 school directors and 417 chauffeurs were interviewed.

Results: The 3 most popular modes of student transportation were personal cars (22%), motorcycles (21.1%), and public buses (16.2%). Conversely, only 7.3% of the students used the school bus services. But the proportion would be about 3 times increased if there were improvements in service quality. Univariate analysis revealed that duration of transportation and level of education significantly associated with traffic injuries (p -value < 0.001). From multivariate analysis, controlling for both above-mentioned variables, adjusted odds ratios (OR's) for traffic accidents from personal motorcycle, bicycle, paid motorcycle, bus, public modified pickup, and personal car; compared to school bus were 5.0 (95%CI: 3.44, 7.33), 4.3 (95%CI: 2.60, 7.21), 2.9 (95%CI: 1.82, 4.55), 2.4 (95%CI: 1.64, 3.49), 1.6 (95%CI: 1.02, 2.62), and 1.5 (95%CI: 1.04, 2.11) respectively. Adjusted OR's for traffic injuries from personal motorcycle, bicycle, paid motorcycle, bus, and public modified pickup; compared to school bus were 7.7 (95%CI: 4.61, 12.82), 5.4 (95%CI: 2.80, 10.45), 4.3 (95%CI: 2.39, 7.49), 2.8 (95%CI: 1.64, 4.73), and 2.3 (95%CI: 1.27, 4.30) respectively. Eighty-five per cent of school bus services

were independent to the school administration, and none of them satisfied the presently enforced regulations.

Conclusions: Although the majority of the school bus services did not abide by the present regulations, there was enough evidence that school bus services were the safest mode of student transportation. The proportion of school bus service used was 7.3% but this could be raised to 3-5 times if quality of the service improves. This is a challenging task, as school bus service benefits not only for child safety but also decreasing traffic jams.

Incomplete Duplication of the Esophagus: A Case Report

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A case of incomplete duplication of the esophagus is presented, which was diagnosed in a 2-year-old girl with esophageal perforation. The endoscopic findings were described. Initial resection of the esophageal duplication was performed.

NEUROSURGERY

Is Navigator/C-arm Fluoroscope Needed in Endoscopic Transsphenoidal Surgery?

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Introduction: Transsphenoidal surgery is one of the standard surgical procedures for pituitary tumor removal. It can be performed by either microscopic or endoscopic method. Nowadays, under the concept of minimally invasive neurosurgery, endoscopic transsphenoidal surgery is worldwide accepted. However, by any means, identification of sphenoid sinus and floor of sella turcica is one of the most common pitfalls during surgery. The importance of the correct identification, especially the sella turcica, is to avoid fatal complications of massive bleeding from cavernous sinus and the internal carotid artery injury. Usually, surgeons use the C-arm fluoroscope to identify these important landmarks. In the well-equipped department, neuronavigator may be used as well. However, using these trackers is cumbersome. Continuation of the operation is also interrupted.

Materials and Methods: From December 2001 to May 2004, 47 cases of pituitary tumor were operated using

endoscopic technique. The first 5 cases were operated under C-arm fluoroscope. After that, no guidance was used. Only the anatomical landmarks and the careful study of preoperative radiological investigations were studied. Identification of sphenoid sinus and floor of sella turcica was easily done without any special instruments.

Conclusions: From the study, C-arm fluoroscope or neuronavigator seems to play less significant role in endoscopic transsphenoidal surgery. The synopsis of surgical procedure using only the anatomical landmark and preoperative investigation will be demonstrated.

Telomerase Immunoreactivity in Tumorous and Non-Tumorous Brain Lesions with Endothelial Proliferation

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Background: Telomerase is an enzyme which involves in cell immortalization and in the development of several human cancers including gliomas. The expression of telomerase has been found not only in the tumor cells but

also in the proliferating endothelium in high-grade glial tumors. Endothelial immunoreactivity of telomerase in benign and malignant brain lesions has not been investigated.

Objective: To evaluate the immunoexpression of telomerase of proliferating endothelial cells in tumorous and non-tumorous brain lesions and to determine whether the expression has a role in the differential diagnosis of surgical neuropathology.

Materials and Methods: Formal formalin-fixed, paraffin-embedded specimens of 12 primary brain tumors (6 glioblastomas, 3 anaplastic oligodendrogliomas, 1 anaplastic oligoastrocytoma, 1 anaplastic ependymoma and 1 pilocytic astrocytoma) and 7 non-neoplastic lesions (1 cerebral infarction and 6 brain abscesses) were immunostained with antibody against human telomerase reverse transcriptase (catalytic subunit).

Results: Telomerase immunoreactivity was observed in the neoplastic cells of all tumor samples examined. It was also present in the proliferating endothelium in both neoplastic and non-neoplastic conditions.

Conclusions: immunoreactivity of telomerase by endothelial cells is not restricted to neoplastic conditions of the nervous system. Such endothelial expression is therefore not useful in the differential diagnosis of surgical neuropathology. However, the current study has demonstrated, for the first time, telomerase immunoreactivity in the endothelium of non-neoplastic brain lesions. Other factors should contribute to the biological differences of the proliferating endothelium in the benign and malignant processes.

KI-67 Labeling Index, Hormonal Status and Invasiveness of Pituitary Adenomas: A Clinico-pathological Study of 53 Cases

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Background: Conventional histopathology has been proven not to be a reliable measurement of the behavior of pituitary adenomas. Although most of the previous studies reported KI-67 leveling index (LI) to be associated with the invasiveness of pituitary tumors, few have failed to replicate such finding.

Objective: To evaluate the relationship between KI-67 LI, hormonal status, and the invasiveness of pituitary adenomas.

Materials and Methods: Fifty-three adenomas were immunostained with adeno-hypophyseal hormones and KI-

67. KI-67 LI was recorded as being high ($\geq 3\%$) or low ($< 3\%$). The invasiveness of tumor was defined by the radiological criteria. Mc Nemar chi-square test was used to evaluate the relation between the KI-67 LI, hormonal status, and the invasiveness of pituitary adenomas.

Results: Of the 53 adenomas, 45% were functioning. The two most common adenomas were null cell (47%) and corticotroph (13%) adenomas: the latter represented the most frequent functioning tumors (17%). Thirty cases (66%) were invasive and of the invasive tumors, 52% were non-functioning. The most common invasive functioning adenomas were ACTH- and GH-adenomas (5/24 cases each) where as null cell adenoma is the most common invasive non-functioning tumors (17/29). Of the 35 invasive adenomas, 24 and 11 cases showed low and high KI-67 LI, respectively, and of the 18 non-invasive tumors, 15 and 3 cases showed low and high KI-67 LI, respectively. No statistical significant correlation was found either between the functional status and the invasiveness or the KI-67 LI and the invasiveness.

Conclusions: The invasiveness of pituitary adenomas has not been found to be associated with either KI-67 LI or hormonal status in our present series. The role of other biological markers and the invasive behavior of pituitary adenomas should be further explored.

First Hour Management of Acute Head and Spinal Injury

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Introduction: Hypoxic ischemic damage due to reduce cerebral and spinal cord blood flow is the main cause of poor outcome in acute head and spinal cord injury patients. Review of risk factors that contributed to death and severe neurological deficits during first hour management in a large urban tertiary trauma care center could prevent further aggravation of these preventable conditions.

Methods: Retrospective review of 4,914 admissions during three-year period (2000-2002) at Trauma Center, Siriraj Hospital revealed 179 deaths (2.8%) and 53 deaths on arrival. There were increasing numbers of patients being admitted within less than one hour from scene of accident to the emergency room from 400 in the year 2000 and 584 in 2001 to 712 in the year 2002. Major etiologies leading to death were from transportation (99/1,751 admissions) and falling from height (152/1031 admissions).

A careful analysis of different causes of death will contribute to surgical approaches to improve outcome.

Results: Pitfalls leading to poor outcome included severe head injury in children, complete cervical cord injury, neurovascular injury such as carotid and vertebral artery dissection, severe epistaxis from ruptured false aneurysm of carotid artery and fat embolism. Focal areas of CT changes were detected in sequential neuroimaging as high as 51%, basal ganglia and thalamic hemorrhage constituted 35% of focal hypoperfusion detected in acute head injury with history of reduced cerebral blood flow.

Conclusions: 1. Strict adherence to first hour

management protocol by application of multimodality monitoring of ICP and cerebral blood flow will alleviate poor outcome. 2. Increasing awareness of risk factors in acute head injury and preponderance of upper cervical cord injury in children due to immaturity of bone or joints and ligaments will prevent further neurological deficit. 3. Neurovascular injury should be considered when acute head injury patients presented with clinical features of ischemic stroke. Carotid and vertebral artery dissection, false aneurysm of the internal carotid artery and fat embolism are determinants of poor outcome if appropriate treatments are not promptly instituted.

PLASTIC SURGERY

Facial Anthropometry in Thai Women

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Many previous literatures that studied about normal range of soft tissue cephalometry included aesthetic range, but most of them studied in Westerns, rarely in Asians, especially in the recent study for Thai people (the last study by Satravaha S, in 1987).

In this study, we measured the normal range of facial anthropometry in 118 Thai women, and also compared variable parameters between the ordinary Thai faces (normal group) and aesthetic Thai faces (beautiful group).

The results showed some different parameters comparing to Western's data, especially in sensitive areas (eyes, nose, lip) and these areas also were different between normal group and beautiful group. The information may be used for correction deformity (congenital or acquired) of face or for aesthetic requirement in Thai women.

Surgical Management of Total Avulsion of Scalp

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Total avulsion of scalp is a serious injury that is often occurred by industrial and agricultural machinery. It generally results from entanglement of long hair in rotary machinery. The best management for the sake of functional and cosmetic purpose of this type of injury is to replace the avulsed scalp with its own tissues. But if replantation is unavailable or impossible, scalp reconstruction must be

planned to minimize morbidity. Former treatment plan, split skin graft has been a popular treatment by perforating the outer table to allow diploic stimulation of a granulation bed that can be split grafted and some surgeons used immediate graft by VAC technique. Well-vascularized coverage is now more popular such as omentum free flap, latissimus dorsi free flap or groin flap in some cases. From year 1995 to 2004, the author had 4 cases of total avulsion of scalp, 2 cases for replantation (failure 1 case, success 1 case), 1 case for omentum free flap and 1 case for galeal flap plus skin graft. The outcomes satisfied all patients.

Conclusions: Total avulsion of the SCALP is associated with significant physical and psychological morbidity. Microsurgical replantation is the treatment of choice. But if replantation is unavailable, one stage reconstruction with well-vascularized tissue must be planned. The use of surrounding galeal flap, free omentum transfer or free latissimus dorsi flap must be used.

Improvement of Outcome of Unilateral Cleft Lip Repair in Prince of Songkla University Hospital

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The cases of unilateral cleft lip repaired by one surgeon (VC) in Prince of Songkla University Hospital were reviewed during 1999-2002. Lip, nose measurements were taken pre- and post-operatively according to the protocol designed by ST Lee of Singapore. Repair was done using the modified technique of Millard. The lower lateral ala cartilage was dissected without suspension suture. All repairs and measurements were done by the same surgeon. Ten patients with complete or incomplete cleft

lip with or without cleft palate repaired during May 1999 to February 2001 were analyzed. Even though there was no conclusion from this unpublished pilot study, we believed that this study enabled the surgeons to find out the problems from each case pre-operatively, to find the proper technique of repair and to be concerned with the immediate outcome. The previous protocol lacked some parameters. The protocol was modified by adding more accurate measurement to show the symmetry of the nose and the fullness of the vermillion. The lower lateral ala cartilage was dissected and the modified suspension according to Mc Comb's technique was performed. The immediate outcome was an improved symmetry of the lip and a more precise shape of the nose and vermillion.

The Anterolateral Thigh Flap: An Anatomic Study in Thai Cadavers

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Background: The free anterolateral thigh flap has been in widespread used and becoming one of the most preferred options for soft-tissue reconstructions. In Thailand, however, the flap is not widely used because of its wide range of anatomic variations and are difficult to dissect.

Objective: The purpose of this study is to clarify the anatomic characteristics and the pattern of the perforators in Thai cadavers.

Methods: Ten dissections were carried out in 7 fresh cadavers. The dissections began by identification of the lateral branch of the descending branch of the lateral femoral circumflex artery.

After injection of India ink through the pedicle, the flaps were raised. The detail of the pedicles and the perforators were recorded under magnifying loupe 3.5x.

Results: The pedicle was observed in all specimens. The average pedicle length and diameter were 10.64 cm and 2.38 cm respectively. The average flap dimension was 14.5×24.3 cm (352.35 cm²), the average number of perforator was 2.8 per flap, and showed more septocutaneous in fashion (42.8%) compared to the other series. The most frequent location of perforators was over the lower lateral quadrant of thigh (82%).

Conclusions: This study showed reliable primary pedicle of this flap with regard to its anatomic position and whether the cutaneous blood supply is provided by septocutaneous or musculocutaneous perforators, flap dissection is not much difficult to raise.

The Epidemiology of Mandibular Fractures Treated at Chiangmai Hospital: A Review of 198 Cases

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Background: Mandibular fractures constitute a substantial proportion of cases of maxillofacial trauma. This study investigated the prevalence, sex, age group, causes, site and treatment of mandibular fractures at the Chiangmai University Hospital, Thailand.

Methods: The medical records and radiographs of 198 patients treated for mandibular fracture at the Chiangmai University Hospital over a 1 year period (from 1 Jan. 2003 to 31 Dec. 2003) were reviewed. Data on the patients' age, sex, alcohol and helmet use, mechanism of injury, site of fracture, treatment modality were recorded and assessed.

Results: Men 21 to 30 years of age sustained the most mandibular fractures. The ratio of males to females was 5:1. Most fractures were caused by MCA (75.76%), followed by assault (13.64%) and fallings (4.55%). Alcohol was a contributing factor at the time of injury in 79% of fractures for which this information was available. The common fracture sites were, in descending order, the parasymphysis (45.3%), angle (19.51%), condyle (15.68%), symphysis (13.24%), body (3.83%) and ramus (2.09%). Nearly 3/4 of all cases were treated by open reduction (76%).

Conclusions: The incidence and causes of mandibular fracture reflect trauma patterns within the community and, as such, can provide a guide to the design of programs geared toward prevention and treatment.

Can Surgeon Diagnose Speech Resonance Problem by Speech Resonance Screening Test

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Background: Detection of resonance problems in patients with velopharyngeal dysfunction is necessary for an effective early treatment. Routine standard speech assessment and diagnosis of resonance problems are commonly performed by perceptual assessment and instrumental assessment and the speech therapist which there are only a few number in this country. In present economic crisis and with the emphasis increasingly placed on demonstrations of efficacy, the screening procedures with effectiveness and efficiency to be performed by the clinicians who are not speech pathologists is needed.

Objective: To evaluate the inter-rater reliability

between a surgeon and a speech pathologist to diagnose resonance problem by using the speech resonance screening test

Methods: Rather than re-invent the wheel, the researchers used the Speech Resonance Screening Test (Sriwimon Manochiopin and Apirag Chuangsuwanich, 2004) for screening the resonance problem in a busy clinic. The purpose of this study was to reveal the reliability of the test. Inter-rater reliability between 2 clinicians, a surgeon and a speech pathologist, in assessing the resonance aspect was examined. The items of the test are divided into 4 subtests corresponding to the phonological system and velopharyngeal function (i.e., 1 subtest for oral sound production, 1 for nasal sound production, 1 for mixed oral-nasal sound production, and 1 for nonverbal velopharyngeal function). A simply pass-fail scoring system was used. Prior to the study, a short training in administration the test was provided to the first researcher who was a surgeon by the third researcher who was one of the authors of the screening test. The training program focused on recognition and rating skills by listening to ten various speech resonance characteristics. Five speech samples were played from the

audiotapes as well as another five from the live subjects. All speech samples were examined and judged by the raters. Then, the test is administered to a patient group who had velopharyngeal dysfunction and a normal group (matched age and gender).

Results: One hundred subjects aged 5-63 years, 50 in each group, participated in this study. Subjects were assessed and their speech characteristics were judged and classified into 1 of the 4 categories: normal, hypernasality, hyponasality or mixed hyper-hyponasality. The nasalance scores obtained from the nasometry of each subject was used as a gold standard criteria in confirming the resonance disorders. Based on the mean nasalance scores of the subjects, it was found that the normal group had a significant nasalance mean score difference from the patient group in their oral and mixed speech productions ($p < 0.001$). The results showed high inter-rater reliabilities with the Kappa values of 0.9, 0.94, 0.958 and 1 for subtest 1 to subtest 4, respectively.

Conclusions: It appears that the surgeon can detect the speech resonance problem by using the Speech Resonance Screening Test.

UROLOGY

Ciprofloxacin versus Cotrimoxazole in Prophylaxis Against Bacteremia in Transrectal Prostate Needle Biopsy

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Objective: To compare the effect of antibiotics prophylaxis between ciprofloxacin and cotrimoxazole on infective complications after transrectal biopsy of the prostate.

Patients and Methods: Between January 2001-December 2003, 247 patients who satisfied the inclusion and exclusion criteria entered the study; patients were compared into two groups. Patients in group 1 (130) received ciprofloxacin (500 mg) twice a day for 3 days; while those in groups 2 (117) received cotrimoxazole twice a day for 3 days. Urine culture and hemoculture were obtained from patients who developed fever. The infection rates in both groups were compared using Chi-square test.

Results: Two patients in each group were infected post prostate biopsy. Thus there was no statistical significant difference between the two groups (1.54% and the 1.71% respectively; $p > 0.05$).

Conclusions: Our study indicated that a 3-day cotrimoxazole or ciprofloxacin prophylaxis regimen seems to be equally effective.

Gracilis Muscle Flap for the Treatment of Rectourinary Fistula and Urethrocutaneous Fistula

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Introduction and Objective: Rectourinary fistula is uncommon and urethrocutaneous fistula from urethral cancer is rare. Several procedures have been described for the management of these fistulas. The aim of this study was to present the experiences with gracilis muscle flap in the treatment of lower urinary tract fistula.

Material and Methods: A retrospective chart review of 4 male patients (age 23-58 years) who underwent the operation using gracilis muscle flap for the treatment of urinary fistula during January 1997 - December 2003 was undertaken. One patient with urethrocutaneous fistula was due to urethral cancer, two patients with rectourethral

fistula were due to pelvic fractures and one patient with rectovesical fistula was due to perirectal abscess. The latter three patients with rectourinary fistula had colostomy and suprapubic cystostomy before definitive treatment, two patients had previous failed attempts to repair the fistula and one patient had fecal incontinence from anal sphincter injury.

Results: One patient with urethrocutaneous fistula from urethral cancer underwent total pelvic exenteration and closure of perineal defect with gracilis myocutaneous flap, and the patient died 1 year after the operation. Three patients with rectourinary fistula underwent transperineal fistula repair with gracilis muscle flap interposition. One patient with concomitant complete urethral stricture had repair using preputial skin flap urethroplasty and one patient with anal incontinence had anal sphincter repaired and gracilis muscle was used to create an encirclement of the anus. All three patients had successful closure of urinary fistula and all diverting colostomy were closed later. The patient with anal incontinence had good fecal control.

Conclusions: This result suggests that gracilis muscle flap is useful and effective in the treatment of rectourinary fistula and closure of perineal defect.

Colonization of Internal Ureteral Stent and Bacteriuria

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Objective: To demonstrate the infection rates, colonization rates following the internal ureteral stent placement; the correlation of indwelling time with the infection, bacterial colonization and the value of urine culture to identify colonizing bacteria.

Patients and Methods: 148 stents of 146 patients were evaluated for the bacteriuria and colonization after internal ureteral placement average 8.6 weeks according to the indications. All patients were ambulatory and examined in an outpatient clinic. Urine culture and one centimeter of proximal and distal ends of the internal ureteral stent were taken for culture for bacterial evaluation.

Results: The rate of colonization is 33%, 50% and 54% when indwelling time was less than 4 week, 4 to 6 week and more than 6 week, respectively. Urine culture can detect colonization in 69%. Colonization was not found if the indwelling time was less than 2 week. *E. coli* and *Enterobacter* were the most common colonized organisms.

Conclusions: Colonization is common if the indwelling time is more than 2 weeks, urine culture can detect colonization in about two-thirds of the patient. Even the culture is negative, prophylactic antibiotics that cover gram

negative and gram positive organisms should be administered when the patients require further procedures.

Green Light PVP for BPH, New Laser for Total Vaporize Prostate Tissue, Initial Experiences of 50 Cases

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PVP Green Light KTP Laser is now the latest technology to treat BPH. The capability of the KTP Green Light laser to do total vaporization of prostate tissue with very minimal coagulation zone left gives end results as good as traditional treatment with TURP and even better in some clinical aspect, thus resulting in rapid increase in number of cases being done. Within 2 years after the introduction, this technique has been used in over 30,000 cases worldwide. In Thailand, PVP was started in July 2003. Technique and results in the initial 50 cases of BPH treatment, size ranging from 30 to 120 ml, are presented. Only 40 from 50 cases were available for follow up. Improvement of uroflow and symptoms occurred in 36 cases (90%). Intermediate results showed dramatic improvement in all cases without significant side effects. About 50% of cases had retrograde ejaculation but none had sexual dysfunction.

Conclusions: PVP treatment for BPH is safe and highly effective, with much less side effects when compared to TURP. Long term results need to be followed up.

Experience in Brachytherapy for Prostate Cancer in Rajavithi Hospital

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Introduction: The radiotherapeutic management of adenocarcinoma of the prostate is one of the standard treatments of this disease. Since most complications from external irradiation disturb the quality of life, the treatment was not popular among urologists and oncologists. Two major steps in the management have occurred since early eighties. The first step was the generation of linear accelerators and conformal techniques used during the insertion of radioactive sources directly into the prostate gland. The theoretical advantage of brachytherapy is the physical property of very rapid dose falloff (a few millimeter) because of the very low energy of radioactive sources used (28 keV for I 125).

Material and Methods: This study comprised of 23 patients diagnosed with prostate cancer by TRUS (transrectal ultrasound) with biopsy in Rajavithi Hospital during 2001-2004. The starting PSA of the patients was 6-38.08 ng/ml. Volume of prostate was 17.52-51.49 ml. All of the patients had two operations. The first was for volume study and planning, the second for seeds (I 125) implantation. After that, the patients were followed by PSA every 3 months and computerized tomography in some cases to look for the distribution of seeds.

Results: All 23 patients had satisfactory treatment outcome. Only one patient had second seed implantation. All patients had PSA decreased to the level less than .2 ng/ml in 12 months. No patients had distant metastasis during 1 year of follow-up.

Conclusions: This modern treatment modality for prostate cancer may be the hope for the good quality of life for the patients. But this is just the preliminary treatment and the patients need long-term follow-up.

Outcome of Ureterocele after Endoscopic Management

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Background: Duplication of the calyceal system is the most common upper urinary tract anomaly in childhood, with extreme variable in anatomy and function. The non-functioning upper moiety is usually associated with obstructive ectopic ureter, with or without ureterocele. Ureterocele of the upper moiety is the important factor for surgical correction and has controversy in proper management. Recently recommended primary incision of the ureterocele is more suitable and advantage for younger children but still has high percentage of second operation following the initial transurethral incision of the ureterocele.

Materials and Methods: Children with ureterocele who underwent surgical intervention at Queen Sirikit National Institute of Child Health between January 1999 - December 2003 were retrospectively studied. The medical records, operative notes and imaging studies were reviewed. Sex, age, clinical manifestation, imaging finding, choice of operation and postoperative follow up period more than 6 months were evaluated and analysed.

Results: There were 25 cases with ureterocele, 19 females and 6 males. Mean age was 24.9 months (ranged 1 day to 6 years). 15 cases (60%) underwent transurethral incision, 8 cases (32%) underwent partial nephrectomy and ureterectomy and 2 cases (8%) underwent complete reconstruction: ureterocelelectomy and reimplantation of duplicated ureters. Eleven of the 15 cases (73%) who had

initial transurethral incision required second procedure, 6 had excision of ureterocele and reimplantation of both duplicated ureters, 3 had re-incision, 1 had nephrectomy of single system and 1 had excision of ureterocele and bladder neck reconstruction. Others who had upper tract and complete reconstruction had no complications except for low grade reflux into the distal residual ureteric stump after partial nephroureterectomy in one case.

Conclusions: Transurethral incision of ureterocele provides effective short-term correction of upper pole obstruction, hence it is our first option when immediate ureterocele decompression is required, especially in infancy but it is not a definitive therapy in the majority of cases. Most children still require second procedure.

PVP (Photoselective Vaporization of Prostate) for Large BPH with or without Urinary Retention. New Technique of Laser Prostatic Vaporization and Results

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We reported technique and results of PVP Green Light Laser treatment for large BPH (60-100 gm.) in 17 patients who underwent treatment during September 2003-April 2004. Three patients presented preoperatively with urinary retention while the rest had very poor urination and marked prostate symptoms. All except 2 needed only over night catheterization postoperatively. The other 2 needed up to one week of catheterization. Bleeding were almost none or very mild. None needed blood transfusion. Twelve of the 17 developed strong flow immediately after the catheter was removed on first postoperative day. All developed very strong flow one month after operation. Mild frequency, urgency but easy flow was most found postoperative symptoms. All 3 patients with pre-operative retention surprisingly had very strong flow since the first postoperative day.

Conclusions: PVP is at least as effective in the treatment of large BPH compared to TURP, but with much less side effects and shorter hospital stay.

TVT (Tension Free Vaginal Tape) Experiences in Siriraj Hospital

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Early experience with TVT operation in 41 patients was reported. Retrospective data was collected from patients'

files. 61% of the patients experienced symptoms of stress incontinence only. Of 41 patients, 8 patients and 6 patients underwent A-P repair and anterior repair in the same setting of TVT operation, respectively.

Mean operative time was 60.92 minutes. Estimated blood loss was 77.2 mls with average catheterization time of

3.5 days. Only minor complications were reported, including urge incontinence (2), urinary retention (1) and bladder perforation (1).

TVT operation was safe, simple and suitable as a new treatment option for stress urinary incontinence.