

## PROCEEDINGS OF THE DANISH ORTHOPAEDIC SOCIETY

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### FRACTURE TYPES IN THE PROXIMAL FOURTH OF THE TIBIA IN CHILDREN AGED 0-14 YEARS

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Sixty-six fractures of the proximal fourth of the tibia were found among 800 tibial fractures in children. On the basis of the X-rays the fractures could be divided into four groups: metaphyseal fractures (40), fractures of the intercondylar eminence (16), fractures involving the epiphyseal plate (6) and fractures of the tibial tuberosity (4). The fractures of the intercondylar eminence were all avulsions and the epiphysiolysees were of the Salter-Harris type I, II or III. The fractures of the tibial tuberosities were all fissures. The metaphyseal fractures were distinctly more frequent in the age group 2-8 years, while all other types showed a heavy preponderance among children of 10 years or older. It is concluded that the metaphyseal region represents the locus minoris resistentiae in this part of the tibia in very young children.

### COCCYODYNIA TREATED BY RESECTION OF THE COCCYX

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During the period from 1955-1979, 36 total and 29 partial resections of the coccyx were performed in 65 patients with coccygodynia. The age range of the patients was 12-65 years and no serious complications to the operation occurred. Fifty-five patients were re-examined after a median observation time of 15 years (range 1½-26½ years). Forty-six patients were satisfied with the result; 32 of these patients were free of pain, and 13 had marked, and one slight improve-

ment. Nine patients were not satisfied, but five of these were described as being neurotic and should not have been operated on. There was no significant difference in the results of partial and total resection.

It is concluded that coccygectomy is a good operation if the patients are carefully selected.

### THE RESONANCE OF THE HUMAN TIBIA - SOFT TISSUE DAMPING, MODE OF VIBRATION AND THE RELATION OF THESE FACTORS TO FRACTURE HEALING

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The resonance of long bones can be used as a measure of bone stiffness and as stiffness is closely related to load at failure, the method may be used in the detection of fracture healing. The effects of soft tissues and the fibula are investigated and the mode of vibration was found to be transverse in the sagittal plane with nodes at the points of suspension.

The resonance in the fractured tibia seems to be about 80 per cent of the resonance of the other leg when clinical healing has occurred, but reliable conclusions must await the investigation of larger numbers of patients.

### THE MICROVASCULAR TRANSPLANT FOR DEFECTS OF THE EXTREMITIES

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Forty-three free flaps were transplanted using microsurgical techniques to the upper and lower extremities in 41 patients with defects originating from fractures, burns, amputations, lacerated wounds, infections or tumours. The most commonly used flap was the

thoracodorsal musculocutaneous flap and the osteocutaneous iliac flap, but other donor sites including fibulas and second toes were used for skin defects, combined osteocutaneous defects, bone defects and thumb reconstructions. There were two failures due to thromboses of the vascular anastomoses. Bone healing was usually evident by 6 months, but healing time was prolonged on three occasions due to refracture, infection or pseudarthrosis. Reconstructive microsurgery seems to offer unique opportunities for limb salvage and reconstruction.

#### OS ODONTOIDEUM

K. KJÆRGAARD SEERUP & M. JUHL

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#### SOFT TISSUE RECONSTRUCTION AFTER LOWER LEG TRAUMA

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The results following soft tissue reconstruction of the lower leg in 114 patients with 19 cross-leg flaps, 49 muscle flaps, 14 myocutaneous flaps, 17 dorsalis pedis island flaps, and 26 free flaps are compared. The cross-leg flap seemed to be the most expensive and least dependable way of reestablishing stable soft tissue coverage. The muscle flap and the dorsalis pedis flap appeared to be preferable and equal alternatives to the cross-leg flap in the proximal and distal part of the lower leg, respectively. The free flap also appeared advantageous and seemed to be indicated when simpler reconstructive means would be inadequate or more costly.

#### THE CORRELATION BETWEEN THE NEUROLOGIC DEFICIT AND THE THERAPEUTIC DELAY IN 157 PATIENTS WITH SPINAL CORD COMPRESSION

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In a series comprising 157 patients with spinal cord compression, the regression of the neurologic deficit was correlated to the therapeutic delay. Patients with a benign lesion without bone involvement showed a significant negative correlation between the duration of the delay and the outcome. Patients with malignant cord compression had a poorer prognosis if there was a rapid onset of the neurologic deficit. In 92 cases with a satisfactory outcome the therapeutic delay was 13 h, in contrast to 32 h in 55 patients with an unchanged or deteriorated status, a highly significant difference.

When paraplegia was complete, the chance of a successful outcome was less than 15 per cent in malignant cases, while 80 per cent of patients with benign compressions recovered almost completely.

#### MEASUREMENTS OF THE INTRAOSSEOUS PRESSURE OF THE PATELLA AND PHLEBOGRAPHY IN PATIENTS WITH PATELLOFEMORAL PAIN

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Twenty-one patients with severe patello-femoral pain were examined by means of bilateral intraosseous pressure measurements and intraosseous phlebography of the patella. The intraosseous pressure minus the venous pressure was 30 mm Hg in the patella and 20 mm Hg in the femoral condyles, the pressures in the painful patella tending to be higher. During knee flexion a significant increase in the intrapatellar pressure was found, the increase being most pronounced in the affected patella. An increase in the intraarticular pressure was followed by a highly significant rise in the intrapatellar pressure only.

Irregular contrast pooling in the painful patella was demonstrated by means of intraosseous phlebography. A clearance time of 5 min was found in half of the cases in both normal and affected knee-caps.

#### THE REGIONAL BONE STRENGTH AND BLOODFLOW DURING EXPERIMENTAL JUVENILE ARTHRITIS

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The regional bone strength and bone bloodflow were investigated in hips, knees and ankles during Carrageenin-induced unilateral arthritis of the knee in six immature dogs. The regional bloodflow in the bone was significantly elevated in the metaphyseal cancellous and cortical bone of the distal femur, while insignificant changes in the bloodflow were found in the juxta-articular epiphyses of the arthritic knees, in spite of a nine-fold increase in the bloodflow in the joint capsule. The bone strength in the control limbs was significantly reduced in non-weight-bearing joint surfaces; however, in arthritic limbs a significant reduction of bone strength was observed in all joint surfaces of the knee, most pronounced in the distal femoral epiphysis. No correlation between reduction in bone strength and changes in bloodflow in the bone of the arthritic limbs was observed.

**SCHEUERMANN'S LOW-SEATED  
THORACO-LUMBAR KYPHOSIS****K. HARRY SØRENSEN**Department of Orthopaedics, Odense University  
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Thoraco-lumbar Scheuermann's kyphosis presents as a flat back with lumbar fixation and a high frequency of low-back pain in adolescence. Radiographically, three vertebral bodies in the area T.11-L.4 are wedged 5° or more, narrowing of the discs in or below the kyphosis being frequent as well as Schmorl's intracorporal disc-protrusions.

The prognosis is bad, as 92 per cent of patients had low-back pain at follow-up after 20–40 years. Treatment is difficult, and prophylaxis is therefore very important. The diagnosis should be made in adolescence, and an appropriate occupation should be chosen.

Patients with a long kyphosis including L.1, and especially L.2, also have a rather bad prognosis.

**ANTERIOR INTERBODY LUMBAR SPINE  
FUSION FOR SPONDYLOLISTHESIS****K. HARRY SØRENSEN**Department of Orthopaedics, Odense University  
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Anterior lumbar interbody spine fusion was performed on 65 patients with incapacitating low-back pain due to spondylolisthesis.

At follow-up, 3–8½ years later, 45 out of 52 patients had solid union; 41 (77 per cent) felt improved; and 41 had resumed work. There were no deaths.

Four out of seven patients with non-union had solid fusion after re-operation, two were free of symptoms, and one had slight pain and felt very much improved.

The decision to operate must be taken by very experienced orthopaedic surgeons, and the patients must be well motivated, not too old and without significant psychiatric symptoms.