

PROCEEDINGS OF  
THE NORWEGIAN ORTHOPAEDIC ASSOCIATION  
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EDITOR: BERNHARD PAUS

OSTEOMYELITIS CLAVICULAE

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Infection of the clavicle is rare, only 1–3 per cent of all infections in the long bones.

The source of infection is a complicated fracture, hæmatogen spread, or a complication of subclavian vein catheterization.

*Staphylococcus aureus* is as a rule the infective organism, but the culture often fails.

The infection has an acute pyogenic and a chronic form. Antibiotics appropriate for the sensitive patterns have to be given for a long period, 1–2 years. Prednisone can be given for short periods. Surgery is required to remove ischaemic tissues. Two cases were demonstrated, one acute and one chronic.

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STANDARD EXAMINATION OF UNSTABLE  
KNEES

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The evaluation of unstable knees is difficult, especially in relation to earlier examinations. A standard schedule for assessment of these knees has been used in the last year in Martina Hansens Hospital. The schedule complements the ordinary records by admittance to the hospital. It is used by the surgeons to assist judgement pre- and per-operatively and by later controls. The details of the schedule are referred to.

ANTERIOR CRUCIATE INSUFFICIENCY  
TREATED BY LATERAL STABILIZATION

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In the period 1979–81, 34 patients with a positive Slocum test were operated. Twenty-seven patients, 6 males and 21 females aged 16–63 years (median 29), were available for follow-up examination. The Lysholm

score had a preoperative median of 54 points (range 22–77). After 15–49 months, (median 24 months), median score was 95 (range 14–100). Subjective evaluation gave excellent or good results in 19 patients (70.5%), fair in 3 (11%) and poor in 5 patients (18.5%) Nine patients had a positive Slocum test at follow up.

In conclusion, approximately  $\frac{2}{3}$  of the patients had a stable knee and were satisfied after a median time of 2 years. The excellent and good results were significantly ( $p < 0.05$ ) related to the absence of anterolateral instability.

#### EXTRACONDYLAR TRANSPOSITION OF THE LATERAL THIRD OF THE PATELLAR LIGAMENT IN ANTEROLATERAL ROTARY INSTABILITY (ALRI) OF THE KNEE

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The procedure, which has been recently described (Benum 1982), has been performed in 36 patients with marked lateral pivot shift phenomena after rupture of the anterior cruciate ligament. Twenty patients have been followed for more than 1 year (1–3 $\frac{1}{2}$  years). All patients except three felt that the operated knee was stable. In all these 17 patients the pivot shift tests were negative, except for slightly abnormal movement of the lateral tibial condyle in one. Two other patients had slight ALRI. However, their moderate complaints were due to other instability phenomena. Recurrence of marked lateral pivot shift had occurred in only one patient.

#### Reference

Benum, P. (1982) Anterolateral rotary instability of the knee joint. *Acta Orthop. Scand.* **53**, 613–617.

#### PRIMARY REPAIR OF POSTERIOR CRUCIATE LIGAMENT RUPTURES

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Thirty-two patients with primary repaired posterior cruciate ligament (PCL) injuries were followed up after median 45 months. Only six patients had isolated PCL tears. In 18 patients the injury included a total anterior cruciate ligament rupture. All ruptured ligaments were repaired.

At follow-up, 29 of 32 patients evaluated the subjective results as excellent or good. Functional assessment by the Lysholm knee-score was in good accordance with

the subjective grading. Seven patients complained of instability (giving-way). Fourteen patients had objective instability. The six patients with anterolateral/anteromedial instability had significantly lower knee-scores than the patients with objective stable knees, but no such correlation was found in the eight patients with posterior instability.

#### LATERAL MENISCECTOMY – OPERATIVE TECHNIQUE

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The exposure described by Bruser in 1960 is still used by many Norwegian orthopaedic surgeons for lateral meniscectomy. Since Brown et al. in 1976 described “a simplified operative approach for the lateral meniscus”, we have used their technique which is an effective method for this exposure. It affords full visualization of all peripheral attachments of the lateral meniscus. However, the visualization of other parts of the joint is very poor, and diagnostic arthroscopy is recommended prior to meniscectomy.

#### THE USE OF VIDEO EQUIPMENT IN ARTHROSCOPIC SURGERY

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The main advantages of arthroscopic surgery versus arthrotomy are minimal postoperative morbidity and shorter hospitalization. Many arthroscopic operations can be done on an outpatient basis.

Disadvantages may be damage to the articular cartilage, inadequate treatment necessitating reoperation, and for the inexperienced a more time-consuming procedure.

Closed-circuit television makes arthroscopic surgery easier: the surgeon's working position becomes less strenuous; the assistant can take an active part in the operation; and all personnel in the theatre can follow the procedure. The technique is also superior for teaching, and can be used for documentation.

The use of a sterilizable, solid-state miniaturized video-camera was demonstrated by slides and recording of operations.

### "WHIP-LASH" INJURIES WITH LATE SEQUELAE

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Sixty-nine patients have been followed for several years after whip-lash-injuries. These patients exhibit a characteristic pattern of symptoms, which can be divided into four categories: cervical, cerebral, vegetative and neurasthenic syndromes.

Possible etiologic factors are discussed, and it is concluded that some of these patients should be evaluated for operative treatment. So far, no patient has been operated on.

### OPERATIVE TREATMENT IN CHRONIC LATERAL ANKLE INSTABILITY

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Sixteen patients with chronic lateral ankle instability underwent surgery in 1981 and 1982. All patients had insufficiency of the talo-fibular ligament alone, with elongation, but no discontinuity. The fibulo-calcaneal ligament was infrequently scarred, but never insufficient.

Direct ligament repair was carried out with a very good result in 14 patients. One was not followed up. One remained unstable.

Careful evaluation of the ligaments is important in chronic ankle instability. Isolated insufficiency of the anterior talo-fibular ligament seems quite common. Thus a direct repair of the ligament is possible, and a more demanding ligament plastic may be used for cases with multiple ligament insufficiencies, or failed direct repair.

### LAWN MOWER ACCIDENTS

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Twenty-four cases of rotary mower accidents are surveyed. The 13 accidents caused by the air-cushioned type of mower all involved toes.

All these accidents happened on slopes when the foot slipped under the machine. The danger of using mowers on slopes and how to prevent accidents by using footwear with a good ground grip should be pointed out to the users of these mowers.

Accidents caused by wheeled mowers were mainly finger traumas. Without stopping the motor, the patients had tried to clean the mower and had been hit by the blade. A "dead man bottom" mounted on the handle could have prevented these injuries.

### SCOLIOSIS CAUSED BY ARTERIOVENOUS MALFORMATION

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Pulsative pressure of arteriovenous communications may break down bone tissue. In this paper a case of thoracic arteriovenous malformation is reported. The malformation arose from 12 finger-thick arteries from the thoracic aorta and drained to the right atrium. A shunting of 15–20 l of blood each minute was revealed. The right half of the eighth vertebral body was destroyed with a corresponding scoliosis of 15 degrees. The patient was operated with the assistance of a heart-lung machine, and the arteriovenous malformation was resected. The defect of the vertebral body was filled with bone chips from the iliac crest, and no bracing was used postoperatively. One year later there seems to be successful healing of the bone defect and no progression of the scoliosis.

### TOTAL HIP PROSTHESIS WITHOUT BONE CEMENT

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The results of using the Mittelmeier Hip Prosthesis without bone cement in 28 patients with a mean age of 41 years (range 27–52 years) showed 85 per cent good results. The mean observation period was 17 months. These results were compared to the results in 35 patients with the Ring metal-to-metal prosthesis.

In the Ring series only 61 per cent of the patients over 60 years had good results after 2 years, while 77 per cent of patients 60 years and younger had good results. After a mean observation time of 4½ years 23 per cent of the patients 60 years and younger, had been reoperated, while the same percentage in the group over 60 years was 36.

Total hip prostheses without using bone cement seem to give acceptable results in young patients with intolerable hip pain, while the results in patients over the age of 60 seem less favourable.

### MEASUREMENT OF WEAR IN CHRISTIANSEN ACETABULAR CUPS

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Twenty-one Christiansen total hip prostheses were removed because of mechanical loosening after being used for 3–9 years (mean 5 years).

In the Delrin 150 (polyacetal) acetabular cups the motion/pressure of the head of the prosthesis had made an excentric defect. This defect was measured by making a silicone rubber cast of it. The volume of the silicone castings (= wear/creep) measured 640 mm<sup>3</sup> to 2510 mm<sup>3</sup>, mean 1520 mm<sup>3</sup> (corresponding to a penetration of 0.6 mm to 2.6 mm, mean 1.5 mm). In two additional cups, the penetration was right through the wall of the cup. There was no correlation between the wear/creep and years of use and age or weight of patients.

### TREATMENT OF CHRONIC OSTEOMYELITIS WITH GENTAMYCIN – POLYMETHYLMETHACRYLATE (PMMA)-BEADS

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During the last 2 years, 21 patients suffering from chronic osteomyelitis have been treated with various surgical procedures and gentamycin-pmma-beads. Seventeen are still symptom-free. Extensive surgery, such as sequestrectomies and saucerizations, is still considered to be the most important part of the treatment. Whenever fracture instability is encountered, we use external fixation. Gentamycin-pmma-beads are considered most useful as adjuvant treatment and have obvious advantages compared to the irrigation-suction-treatment which we previously used.

### EFFECTS OF A DISTAL VENTING HOLE IN THE FEMUR DURING TOTAL HIP REPLACEMENT

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The intramedullary pressure in the femur was measured in 18 patients during the insertion of the femoral part of the Charnley total hip prosthesis. Half of the patients had a pressure release hole (diam. 4.5 mm) drilled in the distal end of the femur. In the patients without such

a hole, the intramedullary pressure increased transiently to a median of 390 mmHg during the insertion of the femoral stem, while those with a venting hole had an increase to only 23 mmHg. During the insertion of the stem the group without a venting hole had a drop in arterial oxygen tension of 2.2 kPa and in thrombocytes of  $51 \times 10^9/l$ . The corresponding values in those with a venting hole were 0.9 kPa and  $20 \times 10^9/l$ .

Furthermore, a significant correlation was demonstrated between the increase in intramedullary pressure and the drop in oxygen tension and in blood platelets.

### INHIBITION OF GROWTH-REGULATING SUBSTANCES AND FRACTURE-HEALING BY INDOMETHACIN IN RATS

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In 60 young male Wistar rats, a left closed mid-diaphyseal femur fracture was performed. The fracture was left to heal without immobilization. Half of the animals were given indomethacin by stomach tube once a day (2 mg/kg/day) for 10 days; the others received the vehicle. Throughout the 20 days during which the fractures were followed, the indomethacin-treated rats had delayed fracture-healing compared to the controls, increased fracture-instability and increased angulation on X-rays. Furthermore, on the 5th day of medication the intact right femur of the indomethacin-animals had a lower bending strength than that of the controls and a reduced activity of growth-regulating substances in serum. Thus, the known inhibition of fracture-healing by indomethacin might, at least partly, be explained by reduced activity of growth-regulating substances in blood.

### EFFECTS OF ACETYLSALICYLIC ACID ON IMPLANTED BONE MATRIX AND BONE MARROW

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The osteogenic potential of bone matrix and bone marrow placed in the back musculature of rats has been studied. Antigen-extracted, demineralized bone, pre-labelled with 14-C-proline, was used as bone matrix alone and together with isogeneic bone marrow. Half of the recipient rats received acetylsalicylic acid for 18 days. Before sacrifice, Strontium-85 and 3-H-proline were administered to assess new bone formation. Transplantation of bone marrow increased both the bone matrix resorption (loss of 14-C-hydroxyproline) and new bone formation compared to bone matrix only. Acetylsalicylic acid inhibited this increase in bone metabolism, i.e. reduced the effect of bone marrow.

### THE ULTRASTRUCTURE OF TENDO M. TIBIALIS POSTERIOR IN NEWBORN INFANTS SUFFERING FROM CONGENITAL CLUB FOOT

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We have examined biopsies of the tendo m. tibialis posterior from 10 infants subjected to tenotomies within the first week after birth. By light and transmission electron microscopy we found: collagen fibril packing, diameter, and cross-striation; microfilament density and structure; fibroblast density, shape and structure; capillary endothelium, basement membrane and pericytes and peritendinous tissue elements all to be within the normal range. No signs of inflammation were present in any sample.

We conclude that the etiology of congenital club foot is unlikely to be related to the tendon tissue of the m. tibialis posterior.

### EXPERIMENTAL FRACTURE HEALING AFTER EXTERNAL FIXATION AND METAL PLATE FIXATION

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A transverse midshaft osteotomy was made on one tibia in 50 rabbits. The osteotomies were fixated with a steel plate in half of the animals, and with external mini-fixation in the rest. Bone healing took place by periosteal, intramedullary and intercortical callus after both methods. At 6 weeks, the bending strength of the healing bones was significantly greater after plate fixation than after external fixation. No significant differences in biomechanical qualities between the two methods were found after either 4 weeks or 12 weeks. It is concluded that the speed of bone healing was more rapid after plate fixation than after external fixation.

### OSTEOSYNTHESIS OF CAT FEMURS BY MEANS OF INTRAMEDULLARY RODS

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An experimental model has been developed using intramedullary rods for osteosynthesis of feline femurs.

As the stiffness of the rods was expected to influence the behavior of the hosting bone, rods of two different stiffnesses were compared. A compact cement-fixed titanium rod served as the rigid rod, and porous titanium (fiber metal) as the flexible rod. Some preliminary results were presented.

### A NEW AID IN POSTOPERATIVE JOINT MOBILIZATION

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Motorized KINEC (Knee- and Elbow-exercisers) were used during the first 5 days immediately after synovec-tomies of knee-joints (12) and elbow-joints (4) for rheumatoid arthritis. The active training program was unchanged.

The maximal passive extension achieved during operation was preserved with flexion around 90°.

There was a substantial reduction in pain during training as well as faster and better recovery of motion, without any obvious increase in postoperative bleeding or delay in healing. The occasional mobilization in general anesthesia will no longer be necessary.

### NEUROMA INTERDIGITALIS PLANTARIS (MORTON'S METATARSALGIA)

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We wish to mention our experience with 12 cases of this neuroma diagnosed between 1977 and 1983. The patients in our series ranged from 29 to 61 years of age and women were afflicted five times more frequently than men.

One-fourth of the patients had bilateral involvement of the feet. One patient had four neuromas. Morton's neuroma presents varying degrees of pain about the fourth metatarsophalangeal joint and in the third metatarsal interspace, which is aggravated by weight bearing.

This painful disease, which is not strictly a metatarsalgia, may during severe paroxysms extend up the limb as far as the hip and spine. Surgical resection of the affected digital nerves with the dorsal approach relieves the pain.