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Surgically treated infants with obstetrical brachial plexus injury

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Introduction: About 100 cases of obstetrical brachial plexus injury are reported in Sweden. In most cases the lesion is mild and the palsy disappears after a short period of time. If there is severe damage to the plexus, however, there is little chance for recuperation, and the child remains handicapped. Because of the encouraging results reported after microsurgical reconstruction of the damaged plexus (Narakas 1981, Gilbert and Tassin 1984), surgical treatment of severe cases of obstetrical brachial plexus lesions has been performed.

Patients: Twenty children aged 4–19 months have been operated on. The patients were examined preoperatively by means of neurophysiology (EMG and somatosensory-evoked potential) and with cervical myelography combined with a CT scan. Somatosensory-evoked potential was also performed during surgery after the roots of the plexus had been dissected free. The injured parts of the plexus were reconstructed with nerve grafts (sural nerve) and in some cases also with neurotization (accessory nerve and motor branches from the cervical plexus).

Results: The obstetrical plexus lesions were always supraclavicular and of two types: total or partial (only the upper roots—C-5, C-6, and C-7 were damaged). Isolated lower root injury did not occur. Infants that had not regained power in the biceps muscle at 2–4 months of age were subjected to surgery. At surgery, it was found that they had neuroma in continuity sometimes in combination with root avulsion injury. In cases of total plexus injury, one or more roots were always avulsed. Recuperation began 2–6 months postoperatively. The best results were obtained after reconstruction of partial (upper plexus) lesions.

Conclusion: The brachial plexus injury is often a combined peripheral and central nervous system injury. Children with obstetrical plexus injury without return of function in proximal muscles, i.e., biceps, during the first months after birth have such a severe degree of nerve injury that spontaneous recovery is less likely. By means of microsurgical reconstruction of the brachial plexus, it is possible to reconstitute function not only in the arm, but also in the hand.

The percentage of migration: A measure of lateral dislocation of the femoral head

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Subluxation or dislocation of a hip is associated with several pathologic conditions, and may develop insidiously. The degree of subluxation is described verbally in lack of objective methods of assessment. The percentage of migration (reintroduced by Reimers in 1980) has been determined in hip instability following cerebral palsy, poliomyelitis, Legg-Calvé-Perthes disease, and myelomeningocele. The method and established norms for the percentage of lateral migration of the femoral head in specific pediatric age groups will be described.

The percentage of migration was determined retrospectively on 203 urograms and 304 pelvic radiographs showing the hips in the "neutral" position in 507 patients, aged 6.7 (1–16) years. The degree of subluxation is expressed as the fraction of the whole width of the femoral head located lateral to a perpendicular (Perkins' line) through the lateral edge of the acetabulum to Hilgenreiner's horizontal at the level of the Y-cartilages.

The 98th percentile of migration increased with age from 16 percent in patients < 4 years of age to 24 percent in patients 12 years or older. Values above the 98th percentile but below 80 percent represent subluxation and higher ones represent dislocation.

Determination of the percentage of migration is recommended as a standard procedure when subluxation is suspected. Abdominal, as well as pelvic, radiographs may be used. The method also permits comparisons with radiographs from other hospitals without knowledge of the focus-film distance. It is especially valuable in serial examinations, and the method is also applicable for relative changes in patients with contractures of the hip.

Intramedullary nailing of femoral fractures in children

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Femoral fractures in children are often treated by traction. Since 1972, some diaphyseal fractures in children between 9 and 15 years of age have been treated with intramedullary nailing at our hospital.

Patients and methods: Totally, 26 patients (21 boys and 5 girls, aged 9–15 years) were evaluated by clinical examination 6 (2–16) years after intramedullary nailing of their femoral fractures. The degree of pain, range of motion of the hip and knee, and leg-length discrepancies were recorded.

Results: All the fractures healed. There were three superficial wound infections. The average hospital stay after surgery was 16 days compared with 12 weeks for patients treated in traction. One patient was reoperated on after 3 months because of nail migration. One patient healed with an external rotation of 45°, and was treated with nail removal and rotational osteotomy. The remainder of the patients had good anatomic results. All the patients, except 1, had the nail removed without complications about 10 months after surgery.

In the long-term follow-up, 23 patients had excellent function, with no pain and a normal range of motion. Leg-length discrepancy did not exceed 1.5 cm. Three patients complained of pain: 1 from the hip joint, 1 from the trochanteric region, and 1 from the back. Radiographic examination of 1 patient with a reduced and painful range of motion of the hip joint revealed an avascular necrosis of the femoral head with secondary arthrosis. The first symptoms of this complication occurred 6–7 years after surgery.

Conclusions: Intramedullary nailing of diaphyseal femoral fractures in children between 9 and 15 years of age is a reliable method that gives good functional results without major leg-length discrepancies. We are, however, concerned about the case with an avascular necrosis of the femoral head, even though the etiology at this stage cannot be determined.

A four-joint case: Mb. Blount and physioly-sis of the hip before 9 years of age

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A 2-year-old girl presented with varus knees and the radiographic appearance of bilateral Mb. Blount. She was operated on in both tibiae at the age of 4, and was followed until her 9th year. During this very year, both hips were treated surgically for physeolysis.

During the first 2 years after the first presentation, no treatment was advised. During this time interval and later, it was noted that the girl increased in height and body weight more

than the normal variation, but there were no signs of pubertas precox or acromegaly. At the age of 4, the femorotibial angle of the right knee was 32° varus and that of the left 27° varus. Both knees were subsequently operated on according to the principles advocated by Zayer (1971).

Physcal growth of the lateral aspect of the proximal tibia was arrested by insertion of two Blount staples in each tibia. Reoperation of both knees was necessitated at the age of 5 owing to staple loosening. At the age of 7, all the staples were removed, as both knees had a valgus angulation of 10–12°. There is still a slight over valgus bilaterally.

During her 9th year, the girl presented at separate time intervals with knee pain and a Trendelenburg limp combined with reduction of hip movements in abduction and inward rotation. Both proximal femoral epiphyses showed the radiographic appearance of a 4–6-mm slip, and both hips responded well to stabilization with a central hook-pin.

Today, the girl is moderately overweight, and she is about 10 cm taller than average for her age group. She has no trouble at all from her hips or knees.

A correlation between stimulated overall growth and physeal disturbances in both the hips and the knees is suggested.

Epiphyseal separation of the medial end of the clavicle: A report of 2 cases

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Traumatic separation of the medial end of the clavicle is a rare injury. It is commonly caused by indirect violence, such as a fall or blow upon the point of the shoulder causing the clavicle to be driven inward and forward. The injury may be suspected in young adulthood because the epiphysis of the clavicle does not begin to ossify until the 18th year and fuses with the metaphysis between the 22nd and 25th year of age. Thus, the injury mimics sternoclavicular dislocation, which cannot occur until the clavicle is mature.

Patients: The first patient was a 10-year-old boy—a back-seat passenger in a traffic accident—who had an indirect trauma to the right shoulder. Conventional radiography and tomography showed a posterior displacement of the medial end of the clavicle. CT and ultrasonography, however, revealed an epiphyseal separation. He was treated with figure-of-eight support, and he recovered completely. The second patient was a 15-year-old boy who fell on his left shoulder. After the initial radiographic examination, a sternoclavicular dislocation was suspected, but CT and ultrasonography 5 days later revealed an epiphyseal separation of the medial end of the left clavicle. He received no treatment, and he recovered completely.

Discussion and conclusion: Epiphyseal separation of the medial end of the clavicle may be mistaken for a sternoclavicular dislocation. Ultrasonography and CT are helpful in establishing the diagnosis. The recommended treatment is

closed reduction or, if the closed reduction fails, open reduction and fixation with Kirschner wire. Our cases recovered without reduction, and both regained full function of the affected shoulder.

Repeated fractures in childhood: An indication of future social maladjustment?

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It has for a long time been under debate whether repeated accidents in childhood are due to individual or external factors. Assuming that an accident-prone behavior exists, it is of interest to study if this leads to social consequences later in life.

Method: Forty-five individuals, aged 23–45 years, who all had four or more fracture episodes before the age of 17 were compared with an age- and sex-matched control group who had only sustained one fracture.

All the patients were inhabitants of the city of Malmö during childhood and adolescence. None of them had any known disease causing bone fragility. After obtaining authorized official permission, the records on criminality, occupation, annual income for 1986, disability pension, and registration at the Department of Alcoholic Diseases, Malmö General Hospital, were searched.

Results: The control group had a higher annual income ($P < 0.05$) than the group with multiple fractures. Nine individuals in the fracture group had been sentenced for criminal offences compared with 6 in the control group (NS). However, the crimes committed by the group with multiple fractures were more severe, more often repeated, and the duration of imprisonment was longer.

There was no difference in the level of education or in the number of individuals registered at the Department of Alcoholic Diseases, or in the number of individuals receiving a permanent disability pension.

Conclusion: Repeated fractures in childhood seems to indicate a risk for severe criminal behavior in adult life. A closer cooperation with the child welfare boards, social and school authorities could form a basis for prevention.