the time of healing. Ipsilateral overgrowth of the tibia averaging 0·29 cm occurred in four fifths of the patients. Most overgrowth occurred within 18 months of injury, but in seven of the 74 patients overgrowth continued throughout the remaining growth period, though at a slower rate. The clear implication is that when children have fractures of the long bones some overlap of the displaced fractured bone ends is preferable to perfect reduction. If a fracture damages an epiphysial plate, causing its partial closure, the resulting shortening and angular deformity may be corrected by excision of the bony bridge produced by premature fusion of the epiphysis. The excised bone is replaced by a free transplant of fat, which allows space for regeneration of the undamaged growth plate[4] and continuation of normal growth.

In the first year of life accurate measurement is impossible and generally unnecessary. A useful method is to mark the tip of each malleolus with a ball point pen and while the ink is still wet apply traction to each foot and press the two ankles together. If the legs are equal in length the two marks will coincide; and if not a gap will show the difference between the two sides.[5] As the child grows clinical measurement needs to be supplemented by accurate radiographic assessment of bone length with a scanogram—a motorised tube head that passes along the length of the limbs and produces an image on an extra long cassette. Accurate forecasting of the ultimate differences in limb length requires radiographs of the wrist to estimate skeletal age. The measurements may then be interpreted in relation to growth charts of femoral and tibial length for boys and girls produced by Anderson and Green.[6]

Surgical correction should be considered when the disparity in limb length at skeletal maturity lies between 3 cm and 15 cm.[7] Lesser differences may readily be masked by minor alterations to footwear—the addition of a small raise to one heel and the removal of a small amount from the other. Most patients are comfortable with a raise slightly less than the exact difference in limb lengths. The simplest method of equalising the length of the legs at the end of growth is by shortening the normal limb by resection of a length from the femur or the tibia and fibula. The main disadvantage is that the patient's height is reduced. This is not a major consideration where the patient is of average height or taller, but the technique is unsuitable for those who are relatively short. Shortening of more than 6·5 cm in the femur and 3 cm in the tibia is not advisable.[7] An alternative procedure is to arrest the growth of the normal limb at the distal femoral or proximal tibial epiphysis by epiphysiodesis, an operation introduced by Phemister in 1933.[8] Growth is retarded by excision and grafting of the epiphysial plate at an appropriate age to allow the abnormal limb to "catch up." This approach requires careful timing.

Surgical lengthening of the leg has a long history and a poor reputation because of the high rate of complications. These resulted from overstretching, inadequate fixation of the bony fragments, and interference with the blood supply with delayed and non-union of the femur or tibia.[9] In recent years, Wagner[1] has improved the technique, successfully overcoming these hazards by secure fixation to the bone of a powerful but neat distraction device attached to one side of the limb only, which enables the patient to walk with crutches two or three days after operation. The technique is still time consuming and requires at least two surgical operations and a period ranging from six weeks to six months in hospital with 12 to 18 months or longer on crutches. In over 150 limbs Wagner has been able to achieve an increase in length of 16 cm in the femur and 8 cm in the tibia.

Shortening of the leg is the easiest procedure and the least time consuming of the methods available, but it has the disadvantage that the operation is on the normal limb. Lengthening is more complex but it can help to equalise much bigger differences in length than can shortening; it requires experience which is not gained in routine orthopaedic practice and is best performed in specialist units.

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Gall stone pancreatitis

In many parts of Europe alcohol is implicated much more often than biliary tract disease in the aetiology of acute pancreatitis,[1 2] but gall stones remain the most common cause in Britain, being held responsible in about half of all cases.[3 4] As small stones may remain undetected in some patients thought to have idiopathic pancreatitis and in some where pancreatitis is attributed to alcohol this figure is probably an underestimate. Patients with gall stone pancreatitis tend to be older than those with alcohol associated disease, and while the overall mortality of acute pancreatitis has fallen to around 10% gall stone pancreatitis remains the more dangerous condition.[1–3]

The fact that gall stones can be recovered from the faeces in some 90% of patients in the first few days after an attack of gall stone pancreatitis[5 6] has supported the concept that pancreatitis in these patients is due to impaction of stones at the lower end of the common bile duct. Impaction proves transient in most cases, and migration of the offending stone into the intestine allows inflammation to resolve. The stones recovered from the faeces are often small, so it is not surprising that they are often difficult to detect radiologically while still in the biliary system. Oral cholecystography and intravenous cholangiography are known to be unreliable in the acute phase of pancreatitis,[7 8] and failure of the gall bladder to opacify cannot be accepted as firm evidence that it is diseased. Similarly, radionuclide scanning is of debatable value, and a strong association reported by Glazer *et al*[9] between obstruction of the cystic duct and gall stone pancreatitis has not been confirmed by others.[8] Ultrasonography, which offers non-invasive investigation without reliance on hepatic function, identified stones in 31 out of 33 patients submitted to early biliary surgery after admission with

acute pancreatitis.[8] Ultrasound is not always so reliable, however, and its ability to detect stones may be compromised in the presence of paralytic ileus and gaseous distension.[10]

Others have attempted to diagnose gall stones in patients with pancreatitis by analysing clinical or biochemical factors, or both, with or without computer assistance.[11–13] While the presence or absence of stones can be predicted correctly in about 90% of cases the approach has not been accepted widely as a sufficiently firm basis for biliary surgery. The value of such predictive systems may lie in the identification of patients in whom more invasive investigation should be considered when the diagnosis of gall stones remains equivocal after ultrasonography.

Early diagnosis of gall stone pancreatitis is important clinically. The risk of recurrent pancreatitis is extremely small if disease of the biliary tract can be eradicated safely by cholecystectomy and removal of all stones from the duct system.[14] The optimal timing of biliary surgery, however, remains controversial, with surgeons moving away from the conventional policy of allowing the attack of pancreatitis to settle and of deferring biliary surgery for six to 12 weeks. Though many patients complete this course safely some fail to settle with conservative management, and up to one half will experience further potentially lethal attacks of pancreatitis while awaiting readmission.[15 16] Acosta and his group[17] have advocated immediate biliary surgery in patients thought to have gall stone pancreatitis on the basis of clinical and biochemical criteria; they found stones at the ampulla in 72% of their patients. In all cases stones were either found in the bile ducts or recovered from the faeces after the operation. In support of this approach they cite a mortality of 2% (one death) compared with 16% in historical controls treated by the conventional policy (conservative management complemented by deferred elective biliary surgery or urgent surgery to treat complications of pancreatitis). This study has all the shortcomings of a retrospective comparison, however, and a recent prospective trial from Atlanta[8] found no differences in mortality, major morbidity, or duration of first hospital stay in patients with gall stone pancreatitis randomised to receive biliary surgery within 73 hours of admission or at readmission after three months. Early surgery may have proved no safer, but it did at least obviate the need for readmission.

Other groups have preferred to allow the attack of pancreatitis to settle before undertaking biliary surgery during the same admission.[15 18 19] While this approach allows safe eradication of biliary tract disease and may reduce the need to explore the bile duct, it does not deal satisfactorily with the small but important group of patients with severe pancreatitis who fail to settle with conservative management. This group presents the real problem in management, and controlled trials are needed to determine whether early surgical disimpaction will avoid complications of pancreatitis and reduce mortality in patients identified at admission as having severe disease by objective grading systems. In skilled hands endoscopic papillotomy now offers a safe and effective means of removing stones from the bile duct in patients without pancreatitis, and the early results in small numbers of patients with pancreatitis[20] suggest that the technique merits further appraisal as an alternative to surgical disimpaction of ampullary stones.

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