Growing fractures of the skull

In 1816 John Howship described a 9-month-old child who had developed partial absorption of the right parietal bone after a blow to the head. The names used since then to describe the condition include meningocele spuria, traumatic cephalohydrocele, traumatic ventricular cyst, and leptomeningeal cyst. More recently the term “growing fracture” has become accepted. There are four characteristic features: a skull fracture in infancy or early childhood; a dural tear; brain injury beneath the fracture; and subsequent enlargement of the fracture to form a cranial defect.

Growing fracture is uncommon; one American series documented only seven patients operated on in 20 years, but a recent paper from London has reported 10 patients seen in 10 years. Most had had their initial injury before the age of 1 year and almost all by 3; the fracture was commonly in the parietal region. The time between injury and diagnosis was generally short; the mean interval was 15 months, the shortest two and the longest 63 months. The diagnoses in this series were made earlier than in those previously reported, probably because surgeons are more aware of the condition now that the criteria for its diagnosis have been established.

Patients most often present with a pulsatile swelling of the scalp, though seizures and neurological deficits such as hemiplegia may occur. Neuroradiological investigations show dilatation of the ipsilateral ventricle with midline displacement to the same side. A porencephalic cyst is generally present and often communicates with the lateral ventricle. In the past, these features have been shown by pneumoencephalography, but CAT scanning is likely to prove valuable in making the diagnosis: it will show up not only the underlying ventricular dilatation and cystic cavity but also the bony defect.

While a growing fracture always implies severe trauma at a time of maximum growth of both the skull and the underlying brain we do not know why the fracture should continue to enlarge. One possibility is that leptomeningeal cysts (fluid-filled spaces between the pia mater and the arachnoid membrane) cause the bone erosion and enlargement. These cysts are, however, rare, and at operation the pia and arachnoid membranes are generally found to be matted together and stuck over the underlying atrophic brain. More probably the fracture continues to grow both because ventricular size is increasing and because the dura is torn. Nevertheless, the relative contribution of these two factors is not clear and the evidence from experimental work is conflicting. After a head injury, changes occur in the dynamics of formation and flow of cerebrospinal fluid, and these may increase its pressure. If the ventricle is enlarged any increase in this pressure will produce a disproportionate rise in the subdural stress; and with a dural defect this increase in stress will cause a pulsatile swelling, which will then erode the bone and increase the defect.

The growth of the fracture, then, results partly from the dural defect. Hence the key to its control is an operation to ensure a watertight closure of the dura. The bony defect itself can then be closed with a split rib graft or with acrylic (which has been used more often in recent years). The outlook after surgery is good: of eight children followed for up to 10 years, five were normal, two had a mild hemiparesis, and only one was slightly mentally backward. The earlier the diagnosis is made the better, but since such fractures are rare repeated radiographs are not justified as a routine in the follow-up of every skull fracture in childhood. Suspicion is indicated only in infants with a parietal fracture with notable separation of the bone edges.

3 Connors, P S, American Journal of the Medical Sciences, 1884, 108, 103.

Quest for excellence

It looks as though we have got postgraduate medical education in Britain about right. There are, of course, things that need watching. Some training programmes are too inflexible, and general practitioners have set their own precedent by having theirs embodied in an Act of Parliament. The method of assessing posts for training has proved expensive and time
The continent urostomy

Every patient who has had a cystectomy has to face the formidable problems associated with urinary diversion. As the procedure becomes more and more routine, long-term survival is now frequent, particularly in patients with congenital deformities such as ectopia of the bladder. The challenge has stimulated surgeons to devise operations which preserve their patients’ renal function and health while causing the minimum possible disturbance to their life. Much of this effort has gone into devising alternatives to an external appliance to collect the urine.

Few would dispute that the most reliable method of preserving renal function, particularly in kidneys already damaged by obstruction or infection, is the ileal conduit pioneered by Bricker.1 The conduit empties into an appliance, with its inevitable skin problems and leakages and the need for stoma care, all of which cause distress and difficulty for many patients. Full rehabilitation can be achieved, with good quality long-term results; but a life dependent on an appliance has inescapable problems. It needs understanding and enthusiasm from the patient—and help and acceptance from his family. With good care of the skin and stoma (under the supervision of a stoma-therapist) the appliance will often remain in place for five days at a week at a time. Drainage bags are now satisfactory, though special arrangements may need to be made for drainage at night. There are obvious limitations—contact sports, for example, are not possible—but the patient can enjoy swimming, skiing, and many other activities.

The alternative of intact ureterosigmoidostomy also offers a good quality of life to patients suitable for the procedure. Normal upper urinary tracts are a prerequisite, but there is always a risk of complications. Even in patients who have survived 40 years or more, reflux and infection can lead to calculus disease and pyelonephrosis, with loss of the kidneys.2 With increasing age rectal continence becomes less dependable, and leakage may be troublesome.

Gillchrist and his colleagues3 pioneered attempts to construct a continent artificial bladder that would require no appliance. These first attempts in Chicago were synchronous with Bricker’s4 work in St Louis in developing the appliance-dependent conduit. Experience worldwide over thirty years (both types of operation were first reported in the same year) underlines the success of the Bricker operation in many hands. Only recently has interest in the continent urostomy returned. There has been no lack of research effort and the results have been fully recorded. Should surgeons start to use this technique more widely in view of its potential benefits?

If the patient is to have a urinary diversion with no appliance his renal function must be preserved and the upper urinary tract must be protected from reflux. Moreover, the management of the urinary reservoir must be simple enough for the patient himself. The ileocaecal segment of the bowel is ready made for constructing a continent reservoir, the ureters being implanted into the ileal tail; but probably no more than half of all ileocaecal valves are naturally competent.4 The alternative is for the ureters to be implanted by an antireflux technique, but ureteric stenosis and upper tract obstruction then become a risk.

The pioneering work of Gillchrist and Merricks and their colleagues was reviewed in 1973 by Sullivan et al.5 Forty patients had had an artificial bladder constructed and 37 had achieved complete continence. All but three had had malignant pelvic disease. The patients had to catheterise themselves at four-to-six-hourly intervals in the day and often once at night. In this group an antireflux technique was used in implanting the ureters but reflux was found in three of the 38 patients investigated. No calculi were found, but one patient had serious renal infection. While only six patients survived for a long time (13-20 years), those who died had succumbed to recurrent carcinoma and not renal failure. Successful results have also been reported from


