Letters

Iatrogenic ex vacuo subdural hygroma: and a complication of the modified “Poppen” suture

Sir: We present an interesting complication of the “Poppen” suture. Problems after evacuation of extradural haematoma by craniotomy include incomplete removal, reaccumulation, and the formation of new haematoma. This occurs on an extradural fluid vacuo and necessitates removal of further clot.\(^1\) We report a case in which an iatrogenic ex vacuo subdural hygroma occurred following the use of a “Poppen” style suture to hitch up the dura.\(^2\)

A 19-year-old healthy male fell off a bicycle and struck his head on the ground. He did not lose consciousness nor did he have a fit, but came into the emergency department unaided complaining of headache. Examination at that time showed him to be fully conscious and alert without neurological disability. Skull radiographs did not show a fracture and he had no other significant injuries. He was allowed home with instructions to return if his condition worsened. He returned to the accident department 8 hours later complaining of increasing headache, nausea and vomiting. He was still fully conscious and only mildly neurological deficit and was admitted by the general surgical team. He continued to remain vaguely unwell and 40 hours after injury developed incontinence of urine. He was referred to the neurosurgical department for assessment. At this stage, he was drowsy but rousable, though confused, he would open his eyes spontaneously when roused and would follow commands with purposeful limb movements. He had bilateral papilloedema and a mild left sided weakness with increased reflexes and an extensor plantar response on that side. The right pupil was slightly larger than the left and there was no impairment of upward gaze.

A CT scan (fig a) showed a large, right sided, frontal and subfrontal extradural haematoma with ventricular distortion. There was no evidence of underlying cortical injury. At operation, which was done via a right fronto-temporal craniotomy, the extradural haematoma was completely evacuated. The underlying dura was not discoloured and remained depressed. It was not opened. Dural hitch sutures were placed at the margins of the craniotomy but the central dura remained depressed. A suture was placed through the centre of the outer layer of the dura and hitched up to the centre of the bone flap across a bridge separating two adjacent drill holes. This is a modification of a suture originally described by Poppen to prevent extradural clot formation.\(^2\) The wound was closed in layers with vacuum drainage of the subgaleal space.

For the first three days, the patient made an excellent recovery. He became fully conscious and the left sided weakness resolved. On the fourth post operative day, however, he became increasingly drowsy with recurrence of left sided weakness. A repeat CT scan (fig b) showed a right sided low attenuation fluid collection suggestive of a reaccumulation in the extradural space. A full coagulation screen was normal. The craniotomy wound was reopened. Surprisingly, no extradural fluid was seen but the dura was found to be tight. On opening the dura, straw-coloured subdural fluid escaped under pressure. There were no blood clots or obvious bleeding points. The underlying brain appeared to be healthy and gradually expanded towards the surface. Following complete evacuation of the fluid, closure was carried out over a subgaleal drain. Following the second operation, the patient has made a complete neurological recovery and

Fig (a) CT scan showing extradural haematoma on presentation.

Fig (b) CT scan showing the presence of a post operative fluid collection. Scan appearances suggest extradural fluid.
has remained well almost a year after his first presentation (fig c).

Eleven per cent of extradural haematoma occur in the frontal region and there is experimental evidence to suggest that dural separation may occur at impact with subsequent formation of clots. This was probably the mechanism of formation of the first haematoma in the case described. It is the formation of the subdural collection for which there are a number of possible explanations. More than a third of patients with an extradural haematoma have an associated intradural haematoma. Delayed intracerebral haematoma are known to occur after evacuation of chronic extradural collections. There is probably no single aetiological factor but mechanisms such as focal ischaemia and rapid shift have been implicated. In this case, it is unlikely that these mechanisms could be used to explain the formation of a delayed subdural hygroma. The arguments against this would be: (a) no loss of consciousness at presentation, (b) the long duration between injury and presentation of the initial haematoma, (c) no evidence of associated clot or focal damage on the initial scan, (d) the brain remained slack at the end of the first operation with no discolouration of the dura, (e) the patient was neurologically normal immediately after operation for 48 hours.

Another possible explanation might be that the dural hitches may have caused cortical or cortical venous injury during insertion. We believe that this was not the case because the patient made a full recovery and was well for the first three days post operatively. The brain showed no signs of injury at the second operation when the dura was widely opened and the cortex inspected; the subdural fluid at the second operation was straw-coloured with no clots or blood seen. The mechanism of formation of this patient’s subdural hygroma is obviously a rare one, and probably resulted because of the long duration of contact between the dura and arachnoid, resulting in a tearing of the arachnoid and escape of CSF subdurally on insertion of the “Poppen” suture. A small tear could then have resulted in a “flap valve” mechanism leading to further accumulation of hygroma fluid ultimately causing pressure effects. Because the brain had remained depressed for 48 hours prior to the first operation, we believe that the insertion of the “Poppen” suture resulted in the formation of an ex vacuo subdural hygroma which needed surgical evacuation. When using the “Poppen” suture, we suggest that this possible complication be borne in mind.

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Fig (c) Follow up CI, showing complete evacuation of the clot.

References


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Traumatic intracranial aneurysms and fistula associated with epidural haematoma

Sir: Traumatic intracranial aneurysms and fistulas, whether due to blunt trauma, penetrating trauma or trauma at the time of operation, are rare and only 124 cases have been reported in the literature. However, a combination of a pseudoaneurysm of the middle meningeal artery, an aneurysm of the prerolandic branch of the middle cerebral artery and an arteriovenous fistula between a branch of the middle cerebral artery and a cortical draining vein associated with epidural haematoma in the same individual has not been reported. Recently, we had an opportunity to treat such a patient; the details of this are described and the pertinent literature reviewed.

A 59-year-old man was admitted to our unit having been knocked down by a minibus. He was unconscious for approximately five minutes. Examination on admission revealed multiple superficial bruises and abrasions over both knees and left elbow. He was fully conscious, orientated and cooperative. Only a mild degree of nominal dysphasia was evident. There were no localising neurological signs. Radiographs of the skull revealed a linear fracture. Next morning he was found to be well, apart from nominal dysphasia, and was discharged home. Two weeks later he was readmitted with the complaints of difficulty in finding words, and not being able to express himself even though he knew what he wanted to say. On examination again a moderate degree of motor dysphasia was evident. There were no other abnormal neurological signs and there was no papilloedema. CT scan could not be performed owing to technical difficulties.
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