Endoscopic assisted posterior fossa decompression

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Summary Technical advances in neurosurgery follow a general philosophy favouring less invasive means of managing surgical disease. We describe a patient with a symptomatic type I Chiari malformation managed by posterior fossa decompression using endoscopic techniques. Technical considerations, including drawbacks of the procedure, are discussed. © 2001 Harcourt Publishers Ltd

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INTRODUCTION
Recent technical advances in neurosurgery follow a general philosophy favouring less invasive means of managing surgical disease. As a general rule, the aim of minimally invasive surgery is to achieve the same operative result as an open operation with less tissue dissection and to minimise collateral tissue damage. In doing so, the patient will benefit from less pain, a faster postoperative recovery and earlier return to work.

The operation of posterior fossa decompression is a well-established and commonly performed procedure in both the adult and paediatric population. We have attempted to use a minimally invasive exposure using an endoscope for adequate visualisation to perform posterior fossa decompression. At the time of writing, there are no reports or series in the English language literature that describe this approach.

CASE REPORT
A 43 year old male presented with chronic headaches, worse on straining and an intermittent cough of several years duration. The patient’s cousin had a recent posterior fossa decompression for a Chiari malformation following an episode of transient quadraparesis after a minor fall.

Clinical examination was normal. MRI scans demonstrated mild posterior fossa encroachment and effacement of the cisterna magna (Fig. 1). The cerebellar tonsils demonstrate mild caudal descent (Fig. 2). The patient agreed to a posterior fossa decompression of the bony elements without dural opening.

Positioning of the patient was using the standard method of prone position with the head in the Mayfield 3 pin fixateur. A 28 mm incision was made superior to the first palpable spinous process. Dissection was carried out under direct vision to reveal the occipital bone above the foramen magnum. A Mollison retractor was used for soft tissue retraction and a 30 and 70 degree endoscope (AESCLULAP) inserted for visualisation. The suboccipital muscles were dissected from the occipital bone using unipolar diathermy. Rather than dividing the muscles in the midline as per a standard approach, the suboccipital muscle bulk was ‘lifted off’ the occiput so as to minimise oozing from divided muscle. Dissection was carried out inferiorly to reveal the posterior arch of the first cervical vertebra (C1).

After adequate exposure of the margins of the planned bony decompression, drilling was commenced using a MidasRex drill. The decompression was completed using 2 and 3 mm Kerrison upcutting punches. The outline of the posterior fossa craniectomy was approximately 3 cm superoinferiorly and 4 cm wide (Fig. 3). Following haemostasis the wound was closed in a standard fashion. No wound drain was used due to the minimal ooze from the wound dissection.

Postoperatively, the patient was mobilised the afternoon of surgery. Total hospital stay was 48 h. At follow-up 3 months after surgery, the patient was symptom free.

DISCUSSION
The Chiari malformation is a congenital or acquired hindbrain deformity that was first described by Cleland in 1883 and further
clarified by Hans Chiari in 1891. It is characterised by displacement of the hindbrain structures below the plane of the foramen magnum. Our patient demonstrates a mild Type I Chiari malformation with no syringomyelia.

There is one case report in the literature using endoscopy for a cervical syrinx cavity in a patient with a Chiari 1 malformation that was inspected with a flexible small-calibre endoscope during syrino-subarachnoid shunting. However, there is no report in the literature to date that discusses the technique of posterior fossa exposure or decompression using endoscope assisted techniques.

The technique in our report would be classified as ‘endoscopic neurosurgery’ following the classification suggested by Hopf and Perneczky. They propose a terminology based on whether the endoscope is used alone or in conjunction with a microscope and if the route of surgical manipulation is through or outside the endoscope. They categorised procedures as endoscopic neurosurgery (EN), endoscope-assisted microneurosurgery (EAM) or endoscope-controlled microneurosurgery (ECM).

The potential benefits of our procedure include minimisation of wound haematoma, rapid postoperative recovery, minimal wound pain and cosmesis. Disadvantages of the procedure encountered include poor visualisation of the bone dissection while using the MidasRex drill due to irrigation spray and technical difficulty in manipulating instruments in the confined space.

Although endoscopy is becoming an important aspect of neurosurgery, many have cautioned the steep learning curve associated with its practice and studies have identified complications of this new technique. We must accept a new minimally invasive technique only if it fulfills the stated aims of the procedure with no increase in the incidence of significant complications. The authors are currently establishing a series of endoscopic posterior fossa decompression cases to address this issue.

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REFERENCES