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Patch technique for repair of a dural tear in microendoscopic spinal surgery

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A dural tear is a common but troublesome complication of endoscopic spinal surgery. The limitations of space make repair difficult, and it is often necessary to proceed to an open operation to suture the dura in order to prevent leakage of cerebrospinal fluid. We describe a new patch technique in which a small piece of polyglactin 910 is fixed to the injured dura with fibrin glue. Three pieces are generally required to obtain a watertight closure after lavage with saline. We have applied this technique in seven cases. All recovered well with no adverse effects. MRI showed no sign of leakage of cerebrospinal fluid.

A dural tear is a major complication in microendoscopic spinal surgery. It requires the surgeon to terminate the procedure and change to open surgery to allow direct suture in order to prevent leakage of cerebrospinal fluid. So far, suture has been the only method of repair. We have developed a patch technique that uses bioabsorbable polyglactin 910 (Vicryl Knitted Mesh, Ethicon, Somerville, New Jersey) and fibrin glue (Bolheal, Astellas, Tokyo, Japan) to seal the dura. This technique can be carried out under the microendoscope and enables the surgeon to continue the procedure without changing to an open operation.

Patients and Methods

Between March 2006 and July 2007 we encountered seven cases of dural tear during microendoscopic laminotomy. There were three men and four women with a mean age of 67 years (55 to 82). The operations were all carried out for stenosis of the lumbar canal and the tears were between 2 mm and 6 mm long (mean 3.4 mm).

A polyglactin sheet was cut into small squares between 3 mm and 10 mm in size. A mesh of the proper size to cover the tear was soaked in fibrinogen solution, placed over the injured dura and gently advanced with forceps until it adhered to the dura (Fig. 1). Several drops of thrombin solution were administered after the polyglactin patch had been placed. Usually three pieces of polyglactin were needed to stop leakage of cerebrospinal fluid completely (Fig. 2). When it was clear that there was no leak from the repair, the decompression operation was continued. At the end of the operation the site was irrigated with saline, and the wound was closed around a suction drain, which remained in place for two days. The patients were followed for a mean of 12 months (6 to 23). An MRI was obtained at a mean of 53 days (34 to 70).

Results

All patients were mobilised on the second day after operation and recovered well. None had symptoms of a persistent cerebrospinal fluid leak or needed reoperation. The mean volume of drainage was 30 ml (0 to 80). The post-operative MRI showed no evidence of a cerebrospinal fluid fistula.

Discussion

Microendoscopic spinal surgery has become increasingly popular for indications that now include lumbar disc herniation[1] and stenosis of the lumbar canal.[2-4] Good results can be obtained with limited exposure and techniques that are less invasive than those of conventional surgery. Technical difficulties and severe stenosis increase the risk of a dural tear. The standard repair technique for a dural tear is direct suture, but in microendoscopic surgery the small working space makes it very difficult to suture the injured dura. There have been reports describing closure without suture[5-8] in conventional spinal surgery, but to our knowledge this is the first description of a technique for dural repair that can be performed during microendoscopic surgery.

Polyglactin is an absorbable material that has been used since the 1980s as a dural substitute.[9,10] It is available as knitted, woven or

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