Interlaminar lumbar device implantation in treatment of Baastrup disease (kissing spine)

ABSTRACT

Background: Baastrup disease (BD) is characterized by the degenerative changes of spinous processes and interspinous soft tissues. It is more common among aged persons. This disorder is a relatively common cause of low back pain. Its incidence is underestimated. A few studies have investigated BD epidemiology and proposed treatment efficacy. The aim of this paper is to establish impact and outcome evaluations of managing the patients with Baastrup disease who have been treated by implementing of floating interlaminar device (FID).

Materials and Methods: Between January 2015 and September 2017, 47 patients have been operated by implementing of FID for BD in our Department of Neurosurgery.

Results: Of the 47 patients, 20 were female and 27 were male with an average age of 51.78. On average, we followed the cases up to 11 months. The most frequent level of disorder was L4–L5 followed by L3–L4 level. The condition of 45 patients improved after surgery according to Oswestry low back pain score and 39 patients could return to their work.

Conclusion: The results from our study corroborate that implementing of FID is a good alternative treatment for patient chronic low back pain due to BD This technique contributes to improving a better living situation for the patients given the correct indications.

Keywords: Baastrup disease, degenerative lumbar spine disease, low back pain

INTRODUCTION

Baastrup disease (BD) is characterized clinically by low back pain that worsens during extension and improves during flexion, excessive lordosis, painful rotation and lateral flexion, and painful palpation at the level of pathologic interspinous ligaments. It is branded radiologically by abnormal closeness and contact between adjacent spinous processes (=kissing spine), flattening and enlargement of the articular surfaces, bursitis, sclerosis, and epidural cystic lesions [Figures 1 and 2]. A few studies have investigated BD epidemiology. One of the rare studies containing a considerable number of the patients demonstrated a prevalence of 41% in 1008 patients.[1] Maes et al. found a prevalence of 8.2% in 539 patients.[2] The effect of sex, age, and ethnic and hereditary distribution is unknown. Despite the lack of sufficient epidemiological data, most authors agreed that BD is a relatively common disorder of the spine.

The BD is usually underdiagnosed running to little effective treatment or mistreatment.

A few reports have been found in literature about management of BD and its effectiveness. Medical management consists of localized injections of analgesics or nonsteroidal anti-inflammatory drugs. Proposed surgical treatments consist of fusion techniques, open decompression, transpedicular instrumentation, and interlaminar lumbar device implantation.
of excision of the bursa, removal of the spinous process, or osteotomy. Positive results have been reported by injection of steroid and local anesthesia into the interspinous ligaments. Some surgeons proposed interlaminar stabilization devices. Recently, some surgeons, including the authors, use floating interlaminar device (FID) for management of BD. But as far as we know, no studies have been conducted in medical literature to determine the effectiveness of this technic. This paper attempts to evaluate the efficiency of implantation of FID and reports author’s experience for the treatment of BD.

MATERIALS AND METHODS

The study was performed at the Department of Neurosurgery in “Centre Clinical de Soyaux” in France. Between January 2015 and September 2017, 47 patients (27 males and 20 females) have been operated by implementing of FID for the treatment of BD. The patient who had other disorders such as disk herniation or lumbar spine stenosis were not included in the study. BD is diagnosed if computed tomography (CT) scan or magnetic resonance imaging (MRI) of the patient shows close approximation or touching lumbar adjacent spinous processes. The latter was considered as necessary and sufficient condition for the diagnosis of BD. Flattening of the articulating surfaces and reactive sclerosis of apposing interspinous surfaces are considered as further signs. Patients had an average age of 51.78 year (40–79). The average length of pain was 13.9 months (5–32). In all patients, MRI and CT scan were performed. Patients were evaluated at least twice during the preoperative period. They were examined clinically at 4 and 12 weeks postoperatively and evaluated with a visual analog scale (VAS) ranging from 0 (no pain) to 10 (worst pain imaginable) and with the Oswestry disability index (ODI), which ranges from 0 to 100. All patients underwent X-ray imaging of the lumbar spine on week 6 postoperatively.

RESULTS

All patients responded to the VAS and the ODI before, during the immediate preoperative period, and 4 and 12 weeks after surgery. Table 1 summarizes the results of this evaluation. 45 patients improved on the VAS after 4 weeks. One patient did not improve and one patient after a period of quiet for 3 weeks. All patients improved on the ODI at 4 and 12 weeks. Patients were followed up for a mean of 11 months clinically and radiologically every 3 months. For most patients, more than one level is involved. L4–L5 was the most affected [Tables 2 and 3].

Surgical procedure

A posterior midline approach is performed in all the patients. The patients are placed in the prone position with slight

Table 1: Pre- and post-operative visual analog scale and Oswestry Disability Index

|                | Preoperative | Postoperative 4 weeks | Postoperative 12 weeks |
|----------------|-------------|-----------------------|------------------------|
| VAS            | 6.13 (3-10) | 1.96 (0-5)            | 1.65 (0-4)             |
| ODI            | 64.2 (42-94)| 23.6 (6-42)           | 22.1 (4-38)            |

VAS - Visual analog scale; ODI - Oswestry Disability Index

Table 2: Distribution of patient as number of sick levels

| Patients number | 1 level | 2 levels | 3 levels | 4 levels |
|-----------------|---------|----------|----------|----------|
|                 | 4       | 31       | 9        | 3        |

Table 3: Distribution of patients as affected levels

| L2-L3 | L3-L4 | L4-L5 | L5-S1 |
|-------|-------|-------|-------|
| Patients number | 6     | 21    | 45    | 12     |

Figure 1: Magnetic resonance imaging, sagittal, illustrating close approximation lumbar adjacent spinous processes at the levels of L3–L4 and L4–L5 and edema at the interspinous ligament

Figure 2: Magnetic resonance imaging, sagittal, illustrating an advanced case of Baastrup disease with sclerosis at the three last level of the lumbar spine
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hip flexion to increase the lordosis. After skin incision, the muscular fascia is identified and opened by a unilateral approach. After dissection, the spinous processes and interspinous ligament (if any) are identified. The interspinous ligament is and if necessary a portion of laminae and spinous process as anterior as possible are removed. A distractor, intended for this purpose, is placed in interspinous space to distract space. The interlaminar device will be placed. Different sizes of prosthesis will be tested to accommodate the prosthesis in place. We prefer that the device is placed under slight tension, to ensure a sufficient distance between adjacent spinous processes [Figures 3 and 4].

DISCUSSION

Although little known, BD is often a source of low back pain.[7‑10] This underestimation can derive from the fact that it is often accompanied with other degenerative lumbar spine disease. Modern imaging techniques have enabled us to know the peculiarities of this disorder. MRI and the CT scan are very useful. Recently, Nishimatsu et al. indicated the interest value of PET scan to support the diagnosis of BD.[11,12] One of the main reasons that BD causes lumbar back pain is the spinous processes are subjected to important forces during movements. These forces the formation of hypertrophic spinous processes. The latter would lead to the formation of nociceptors at the level of interspinous contact.[1,9‑14] Regarding surgical management of BD, we found only two papers in the medical literature. The first one contained only ten patients. The author proposed excision of the spinous process with good outcome.[15] The second contained 64 patients with BD who underwent partial or total excision of the lumbar spinous processes. The results were disappointing.[16] The surgical management, suggested by the author, is focused on three key elements. First, it attempts to relieve patient’s pain by eliminating nociceptors and increase the distance between adjacent spinous processes. This result is achieved by removing the interspinous ligament and some part of hypertrophic spinous processes. Second, this method tries to restore lumbar spine segmental mobility and finally, we pursue to avoid exacerbation of disease, particularly toward sclerosis [Figure 4]. As Table 1 shows, there was a dramatic improvement on the VAS and ODI, 4 weeks after surgery. Thirty-nine patients were on working age. Among them, 31 were on sick-leave before surgery. Twenty-four patients (77.42%) returned to work 1 month after surgery, and among the remaining seven patients, 6 returned to work 2 months after surgery. All in all, 2 months after surgery, 30 patients (96.77%) were able to work in their profession again. Average pain intensity was 6.13 in the preoperative period. It was reduced to 1.96 postoperatively.

CONCLUSION

Our study with an average follow-up of 11 months demonstrated satisfactory clinical results. FID can be simple and effective surgical treatment for BD.

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Conflicts of interest
There are no conflicts of interest.

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