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Original Research

Percutaneous endoscopical transforaminal approach versus PLF to treat the single-level adjacent segment disease after PLF/PLIF: *1–2 years follow-up*

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HIGHLIGHTS

- Adjacent segment disease is a common complication after lumbar surgery.
- The clinical outcome of PE-TF for single-level ASD was similar to those of PLF approach.
- The PE-TF approach was less invasive and more acceptable.

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ABSTRACT

Background: Adjacent segment disease (ASD) is a common complication after lumbar decompression and fusion surgery. Traditional revision-surgery, including posterior lumbar decompression and posterolateral fusion (PLF) or interbody fusion (PLIF) is traumatic. The percutaneous endoscopic transforaminal procedure (PE-TF) has been widely used in patients with lumbar disc disease. However, there are no reports about using PE-TF procedure to treat ASD in the current literature.
Objective: To compare the clinical outcomes between PE-TF and PLF for single-level ASD after PLF or PLIF.
Study design: A retrospective study.
Setting: Department of Spine Surgery.
Methods: There were 64 patients diagnosed with single-level ASD and accepted revision surgery. 33 patients accepted PE-TF (Group A) and 31 underwent PLF (Group B). Oswestry Disability Index (ODI) and Japanese Orthopedic Association (JOA) scores were used to evaluate clinical outcomes. Complications, length of skin incision, hospitalization time and blood loss were investigated according to patient records.
Results: All symptoms had improved at the final follow-up. The improvement rate was 82.75% in group A and 86.28% in group B. The satisfactory clinical outcomes were similar in both groups with no recurrence in all cases. PE-TF procedure had significant advantages in the following items: traumatization, cosmetology, hospitalization time and blood loss.
Conclusions: Clinical outcomes of using PE-TF procedure to treat single-level ASD were similar to those of PLF approach, but PE-TF was less invasive and could shorten hospitalization time.

1. Introduction

Posterior lumbar decompression and interbody fusion (PLIF) or posterolateral fusion (PLF) has been widely accepted by spine surgeons. In the past several decades, solid internal fixation was regarded as the golden standard after lumbar spine decompression. However, many papers have reported that PLIF or PLF could

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markedly accelerate degeneration of adjacent discs [1,2]. In practice, patients commonly suffer from adjacent segment disease (ASD). Before the development of minimally invasive technique, patients who suffered from ASD were always reluctant to accept the traditional open-revision surgery, which meant a painful and traumatic surgical procedure for a second time. However, with the development of endoscopic technique in recent years, the percutaneous endoscopic transforaminal procedure (PE-TF) has been widely used in patients with lumbar disc disease [3–5]. The disc and nerve root can be reached more efficiently under direct visualization. In the current English literature, there are no reports about using PE-TF procedure to treat ASD. Thus, the goal of this study was to compare the clinical results between the PE-TF procedure and traditional PLF for single-level ASD.

2. Material and methods

2.1. Patients

Between August 2013 and August 2015, 33 patients (18 males and 15 females, average age of 70.8 years, range 65–81yrs) underwent revision surgery using PE-TF procedure and 31 patients (10 males and 21 females, average age of 68.7 years, range 64–78yrs) using the traditional PLF technique in our institution. Patients were enrolled according to the following criteria:

1) Patients had a previous PLF or PLIF surgery and were diagnosed with single-level ASD. Disc herniations were clearly seen on CT and MRI preoperatively (Fig. 1);
2) Conservative treatment was not effective for at least 6 moths;
3) No deformity, tumor or trauma.

The patient's demographics and symptoms were showed in Table 1. All clinical symptoms were confirmed by physical examination and radiological images pre-operatively. All the patients chose the surgical procedures themselves after being explained advantages and shortcomings. Written informed consent was obtained from all patients prior to their enrollment in this study.

2.2. The percutaneous endoscopic transforaminal procedure

Thirty-three patients were placed in the lateral position under

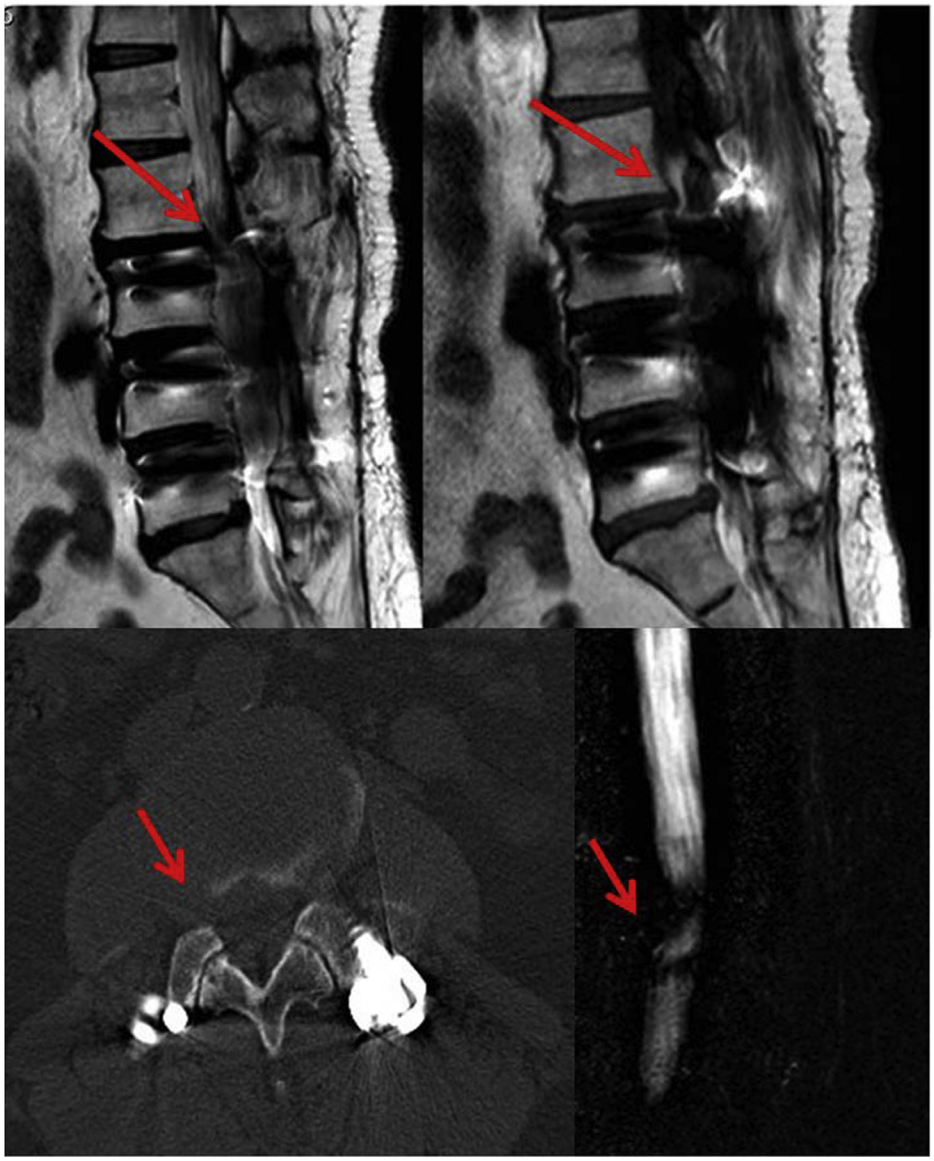

Fig. 1. 60 year-old female who underwent PLF 12 years ago in our institution complained of progressive right leg radicular pain for 2 years. L2/3 segment disc herniation was found on MR images and CT scan (red arrow). (For interpretation of the references to colour in this figure legend, the reader is referred to the web version of this article.)