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Results of revision lumbar spine surgery

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Abstract

Introduction: Lumbar degenerative disease is a common health problem all over the world and the need of revision surgery is still high with variable results. The aim of the work is to evaluate the clinical and radiological outcome in cases of redo surgery for lumbar degenerative pathology and to specify which pathology is responding well to revision surgery.

Method: Twenty patients were operated upon for revision of previous failed back surgery. Selection of patients for revision surgery depends on confirmed radiological and clinical compression or instability. All patients were operated and followed at least 6 months after surgery. VAS score was used as a tool for evaluation of back and leg pain.

Conclusion: Revision spine surgery provides better outcome and results depending on patient's general and physical condition with less chances of re infection specially if operated under proper aseptic precautions.

Keywords: VAS- visual analog scale, PLIF- posterior lumbar interbody fusion, IVD- intervertebral disc

Introduction

Low backache is so common that at least 80% of the population will get it at some point of their lives. Sciatica (Radiating leg pain with or without low back pain) is a common symptom and occurs in approximately 40% of adult population at some point of time but clinically significant sciatica is only 4%-6%.

Intervertebral disc prolapse (IVDP) seems to be the most common cause of Sciatica. Surgical treatments includes discectomy, laminectomy, posterolateral fusion, TLIF and many others. Initially only discectomy and laminectomy were done for disc pathology, But after intervention of pedicle screw fixation system more and more fixation and fusion were done along with above mention techniques. After surgical treatments most patient improves in terms of symptoms. As the surgical techniques became prevalent, sometimes due to failure of fixation, failure of fusion, progression of disease, infections, reoccurring lesions, lesions at other level, implant failure, spinal stenosis, facet arthrosis, myofascial pain, epidural haematoma, symptoms reoccurs which may be same as previous symptoms or different. About 40% of patients undergoing lumbar surgeries for low back pain come with significant amount of pain after the surgery ^[1].

Failed back surgery syndrome is a constellation of condition that describes persistent or recurring back pain with or without sciatica following one or more spine surgery. It was perhaps best described by Follett and Dirks ^[2] as the "surgical end stage after one or several interventions on the lumbar neuroaxis indicated to relieve lower back pain, radicular pain or the combination of both, without effect". Its incidence is 15% ^[1]. This is mainly based on the cause of revision lumbar surgery. Due to previous surgery in spine anatomy is changed which may leads to difficulty in performing revision surgery, which may leads to many complications both intra operatively and post operatively. In this study we are going to evaluate result of revision lumbar spine surgery in terms of radio-clinical results and complication.

Methods

Twenty patients were operated upon for revision of previous failed back surgery. Written and informed consent was obtained from all participants and the study was approved by research ethical committee of Gujarat University. These patients were operated for lumbar degenerative disease before at different centres with no improvement or recurrence of symptoms. They were subjected to full history taking clinical and radiological evaluation. The decision of revision surgery was taken according to definite clinical and radiologic data with the inclusion criteria of:- Recurrent disc herniation, Spinal stenosis, Post laminectomy instability, Adjacent instability, Pseudoarthrosis, Failback syndrome. Clinical evaluation includes meticulous general and local examination for the previous wound, range of movement, straight leg raising and examination of motor, sensory and reflex changes.

Radiological studies included pain x ray anteroposterior, lateral dynamic views, CT lumbrosacral spine was a complimentary tool in some cases but MRI lumbrosacral spine with contrast was done for all cases and it was useful for good delineation of soft tissue pathology and neural element compression. The type of surgery were microdiscectomy, laminectomy and PLIF according to recurrent pathology whether it was recurrent disc, recurrent stenosis or instability. Follow up clinically was done immediate postoperative, 2 weeks and 6 months later and radiologically immediate post operative and after 6 months in cases of fixation or in the presence of complications.

Observation and Results

The incidence of revision spine surgery is between 30-60 yrs and more common in female population than male. Majority cases of revision spine surgery were due to prolapsed intravertebral disc. The average previous surgery is 1.15 among these patients. The majority of patients have pain free interval more than 6 months. Out of 20 patients Fusion was attempted in 13 patients and Fusion was achieved in only 4 patients. In our study, instability Following Previous Surgery is the commonest cause. Out of 20 patients fusion was done among 16 patients, we had two patients with complications (10%), one patient had dural tear (5%), one patient had neurological deficit (ankle-foot weakness) (5%) During Post-Operative Period two Patients Developed Surgical Site infection. mean preoperative ODI scores: 61.9. Mean postoperative ODI scores after 6 months: 35.15. Mean postoperative ODI scores after 9 months: 27.09. Mean preoperative VAS score: 7.65, Mean postoperative VAS score: 4.9 In this study there were three patients with neurological deficit during the revision surgery. One patient who sustained paraparesis grade 3 motor power following the index procedure due to the aberrant screw placement within the canal, for which revision surgery was done and recovery from grade 3 to grade 4 motor power in 6 months follow up period was observed. Other Patient had ankle foot weakness with 3/5 power following primary discectomy after revision surgery there was normal motor power at 6 month follow up. Third one had grade 3 motor weakness following index procedure due to instability, Which also improved to Grade 4 after revision surgery. Average follow up period is 16 months and overall success rate is 60%. Success rate among young patients (< 35 years) is 75% while among patients with age > 35 years is 56.25%. Results among the recurrent disc disease cases: success rate- 75%. Results among the instrumentation failure cases: Success rate: 80%. Results among the instability cases: Success rate: 50%. Result Among Patient with Adjacent Segment Degeneration: 40%. Results among patients with > 1 surgery: success rate; 50%. Results among patients operated once previously: success rate: 61.11%.

Discussion

The successful outcome following a revision surgery for the failed back syndrome ranges from 12-82%⁷⁻⁹. In accordance with the existing literature the patients were evaluated preoperatively by X-rays of lumbosacral spine, flexion and extension lateral views, CT scan and MRI lumbosacral spine. All 20 patients were operated through posterior approach. The overall success rate in our study is 60% which is less than the similar studies like the study conducted by Chak Bor Wong *et al.*^[1], where the success rate was 83.9%. There was a wide range of success rates in the literature regarding revision lumbar surgery and that may be explained by the difference in

patient characteristics, technique, and even the definition of success. The independent factors like age, sex may affect the outcome of the revision surgeries. North *et al.* and Stewart *et al.* concluded that younger patients have better outcome following the revision surgery compared to the elderly age group^[5-11]. In our study younger patients (< 35 years) had very good outcome of 75% compared to the older age group (> 35 years) in which the outcome was 56.25%. This difference may be due to the ongoing degenerative changes in the spine as age increases or may be due to the higher compliance of the younger individuals for the postoperative rehabilitation. In our study there is a marginal increase in the successful outcome in female patients (66.6%) compared to the male patients (50%). However Fritsch *et al.* stated that there is no difference in the outcome following revision surgery based on the gender and age^[12]. The most common cause of Failed back syndrome we encounter in our study was the instability following previous surgery (30%). In the study conducted by Chak Bor Wong *et al.* patients with PFI >6(88%) months had better results than the patients with PFI with < 6 months(76%) but there was no statistical significance in this observation. In our study also we experienced a similar results with a success rate of 61.53% in patients with PFI > 6 months and 57.14% in patients with PFI < 6. In this study there were three patients with neurological deficit during the revision surgery. Overall outcome in these patients however is 66.6%. This is attributed to the poor activity level following the revision surgery because of the neurological deficit. In other words, the positive outcome for the patients with no neurological deficit were successfully predicted. Although we experience a poor outcome in all these patients, there was some recovery in the motor power (ASIA scale) and at long term follow up have better outcome. In this study we have done fusion for all patients with instability. In Three Out of four recurrent disc patients fusion was done. We obtained a good functional outcome in both patients. Patients with higher grade of fusion at month following revision Surgery have Excellent results.

Conclusion

Therefore we conclude that the successful outcome in the fusion group may be due to the short term follow up, which needs further long term follow up to decide. Established fusion with good quality of fusion mass was positively correlated with better results, and could reduce radiculopathy by creating local traction on the tethered nerve root in the direction of the segmental motion^[10-11]. A high fusion rate depended on decorticating the lateral cortex of the superior facet and the dorsal side of the transverse process, eradicating the soft tissue between the transverse processes, preventing soft tissue interposition in between the bone graft, and producing a good-quality bone graft^[1].

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