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MICRODISCECTOMY FOR LUMBAR DISC USING CASPAR RETRACTOR

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ABSTRACT

Background: Caspar retractor is being used by many neurosurgeons over the years for microdiscectomy in lumbar disc prolapse surgery. Microdiscectomy and minimally invasive discectomy decrease surgical exposure and trauma and have success rates of approximately 90%. Minimal access spinal technologies aim primarily at minimizing the trauma associated with surgical exposure of the spine. This technique offers a small incision, excellent magnification, gentle handling of the nerve root, and good exposure. The outcome of surgery depends on the correct level diagnosis and patient selection. **Objective:** The main aim of the study is to assess the surgical outcome of microdiscectomy for lumbar disc prolapse using Caspar retractor. **Method:** This is a retrospective study. A total 650 cases were observed in a private hospital, Dhaka, Bangladesh. Male was 433 and female 217. Study period was 2009 to 2017. Minimum follow up period was 2 years. More than one level surgery was in 24 cases. Inclusion criteria was back pain with sciatica which was not relieved by conservative treatment for 8 weeks. Patients having cauda equina syndrome was excluded from the study. **Results:** Immediately after surgery all patients were pain free. 32 patients needed revision surgery. 14 patients had iatrogenic dural tears. 6 patients had discitis. Wrong level exploration was in 16 patients in whom the nerve root was not tight, and the next level found pathological intra-operatively. There was no direct nerve root injury though 3 patients had weak extensors of toes after surgery which was recovered over 2-3 months probably due to traction injury. **Conclusion:** Microdiscectomy in lumbar disc surgery using Casper retractor through a paramedian incision has many advantages including short hospital stay, less tissue trauma and early recovery. Surgical outcome of this procedure depends on clinical correlation and the correct level surgery.

KEYWORDS: Lumbar, Microdiscectomy, disc, Surgery, Caspar.

INTRODUCTION

Lumbar discectomy is most widely used to relieve pain and strengthen a neurological disorder for a herniated lumbar disk. Throughout their lives, nearly 70-85% of patients experience at least one episode of lower back pain with or without leg pain.[1] Different methods and types of lumbar disc disease treatment have been implemented and many changes have been made to the lumbar disc herniation treatment modalities. Spengler,[2] introduced a limited discectomy that removes fragments of the extruded disk and any loose pieces in the space of the disk. Spengler's method has been popularized as a conventional microdiscectomy for lumbar microdiscectomy. The Caspar Retractor is a specialized lightweight retractor used in the operation of the lumbar disk prolapse. Microdiscectomy and minimally invasive discectomy reduce surgical exposure and trauma, with success rates of around 90%. In intervertebral disk surgery, there are two primary surgical modalities. One is standard open discectomy with partial laminectomy and disc removal, first recorded by Mixter and Barr in 1934.[3] The other is minimally invasive discectomy with percutaneous endoscopic lumbar discectomy and microendoscopic discectomy (MED), first proposed by Yasargil and Caspar in 1977.[4-5] Lumbar microdiscectomy is the gold standard for treatment when conservative treatment of symptomatic lumbar disc herniation with radiculopathy fails. Cochrane's lumbar disc surgery study has shown substantial evidence of discectomy efficacy in patients who have failed conservative management.[6] Microdiscectomy was compared with standard open discectomy in three studies.[7-9] There are also restrictions on minimally invasive spine surgery. Recurring herniation of the disc is another issue related to limited exposure. Patients whose symptoms do not improve with conservative

treatment require surgical intervention.[10] Minimally invasive surgery should have a comparable or better results than traditional surgery, but the access route should be less painful and the natural anatomy should be maintained as far as possible.[11] Aging of the lumbar spine results in some degenerative changes and also may lead to lumbar spine stenosis. Both surgical and conservative treatments are used for the treatment of this.[12] Minimum access to spinal equipment is primarily intended to reduce injuries associated with spinal surgery exposure. The outcome of the operation depends on the correct diagnosis and selection of the patient. Developing the percutaneous techniques for lumbar disc disease is an attempt to improve operating efficiency, reduce post-operative pain, limit the length of hospitalization of the patient, reduce perineural fibrosis, and minimize spinal instability. Reduced tissue damage enables early ambulation, accelerated daily activity resumption and less hospitalization.

OBJECTIVE

Aim of the study is to assess the surgical outcome of microdiscectomy for lumbar disc prolapse using caspar retractor.

METHODS

Type of study: Retrospective Study.
Place of study: Private hospitals, Dhaka, Bangladesh.
Sample size: Total 650 cases were included in the study.
Study period: 2009 to 2017.
Follow up: Minimum follow up was 2 years

Among 650 cases male was 433 (67%) and female 217 (33%).

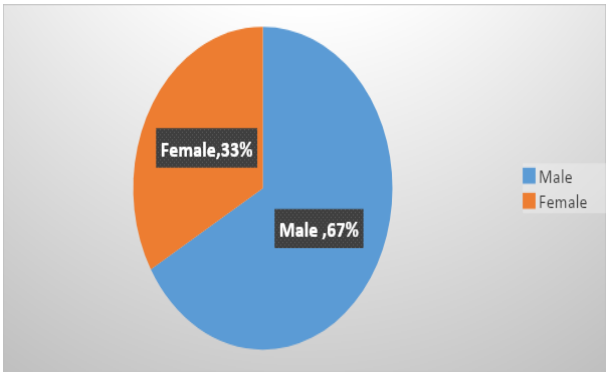


Figure 1: Male and female ratio.

More than one level surgery was in 24 cases. Inclusion criteria was back pain with sciatica which was not relieved by conservative treatment for 8 weeks. Patients having cauda equina syndrome was excluded from the study.

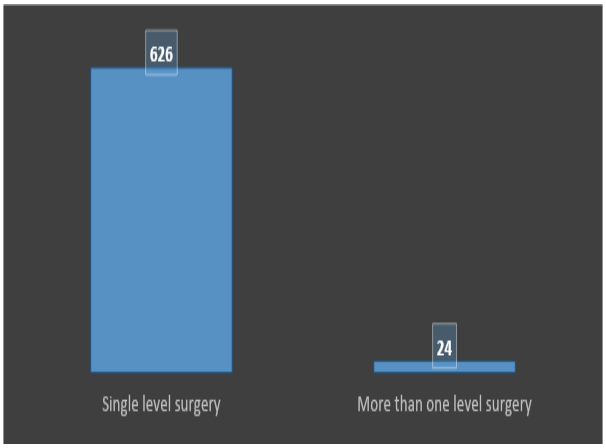


Figure 2: Levels of surgery in all cases.

Figure 3: The positioning of the patient.

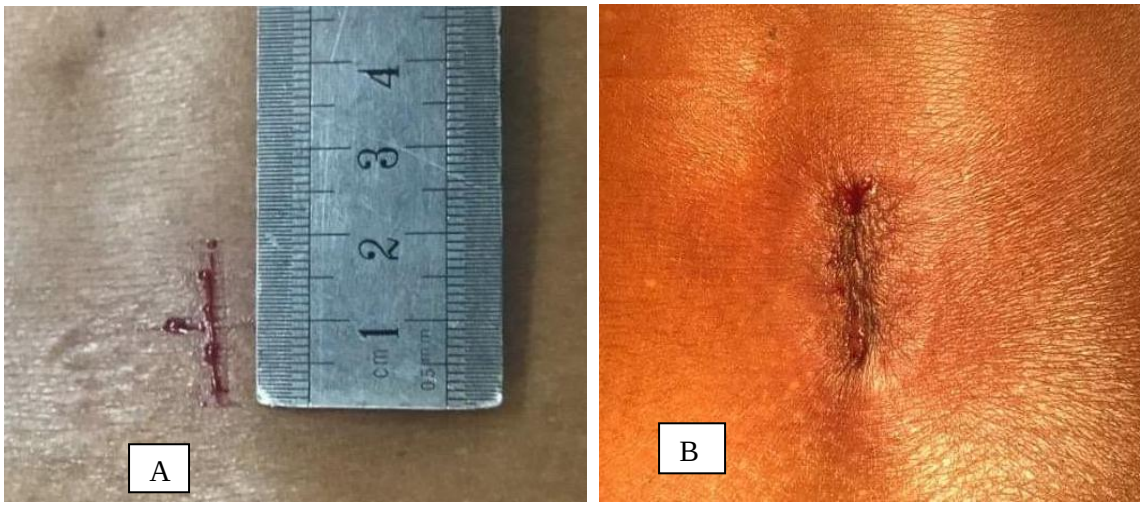
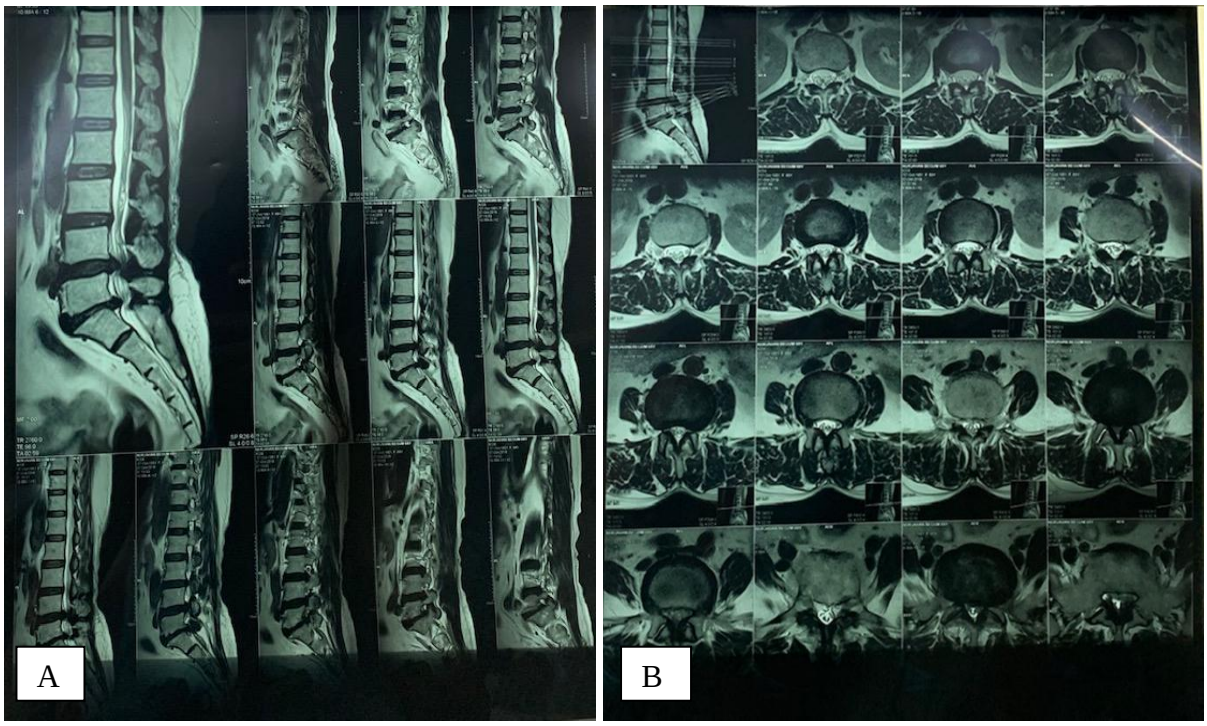


Figure 4 (A, B): Paramedian incision marking (A), Closure (B).

Figure 5: Working instruments.



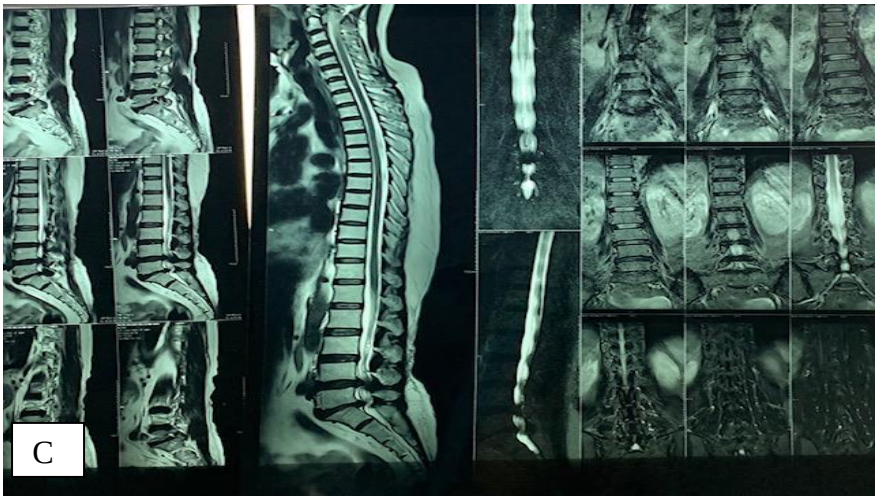
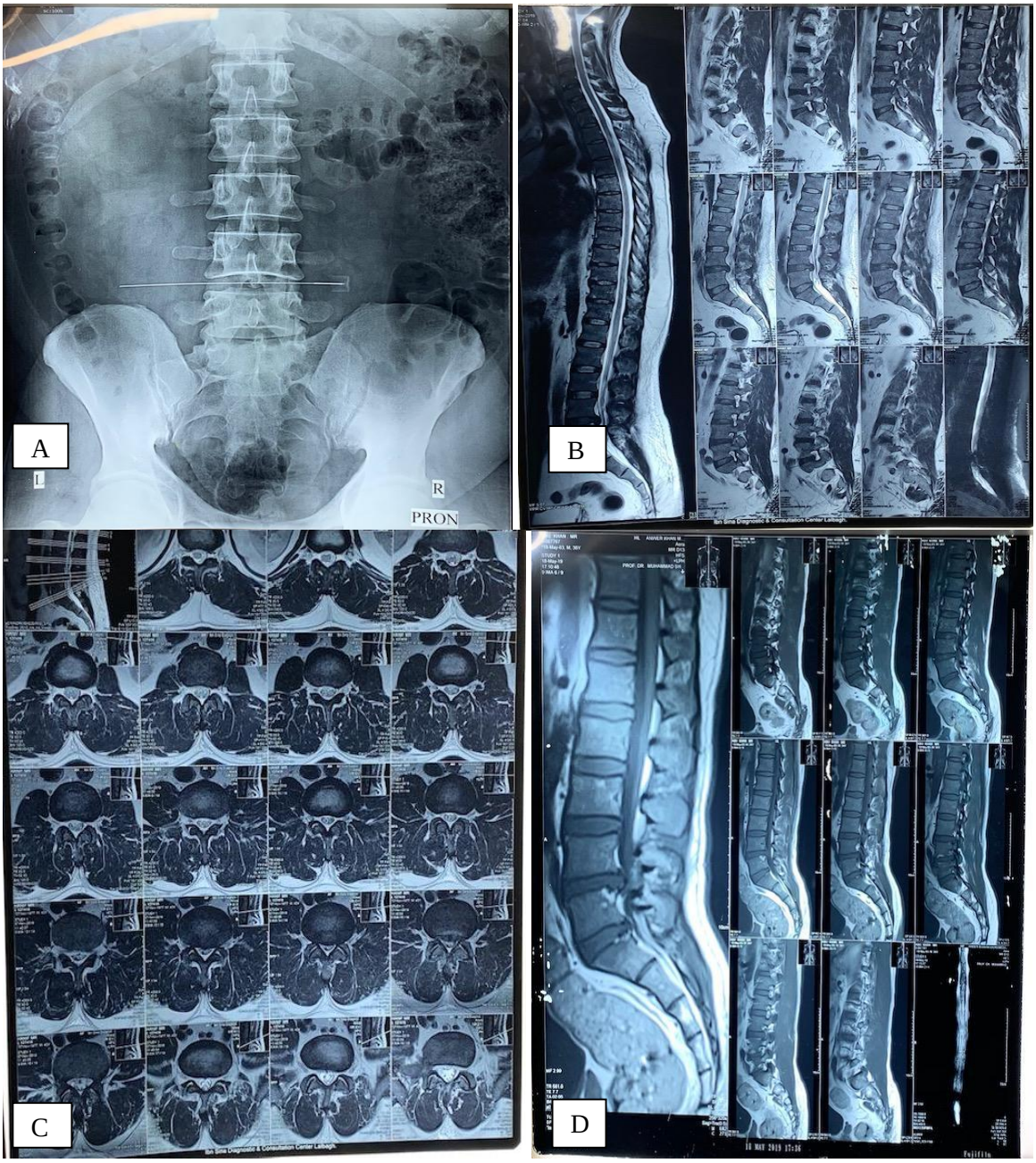


Figure 6: (A, B, C): Preoperative MRI in sagital, axial and MR Myelogram.



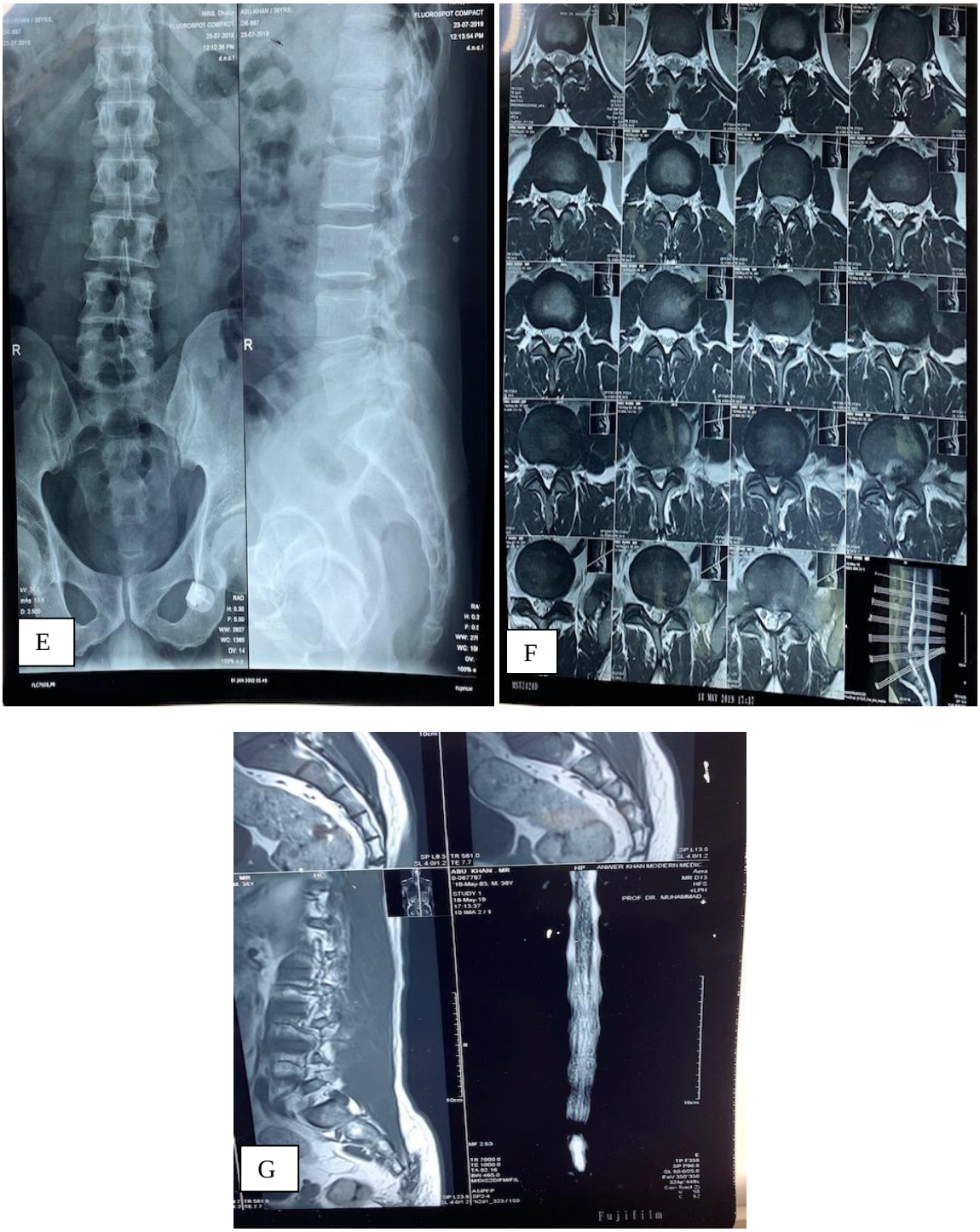


Figure 7: (A, B, C, D, E, F, G): Preoperative MRI and marking X Ray.

RESULTS

Immediately after surgery all patients were pain free. 32 patients needed revision surgery. 14 patients had iatrogenic dural tears. 6 patients had discitis. Wrong level exploration was in 16 patients in whom the nerve root was not tight, and the next level found pathological intra-operatively. There was no direct nerve root injury though 3 patients had weak extensors of toes after surgery which was recovered over 2-3 months probably due to traction injury.

Table 1: Patient conditions after surgery.

Findings after surgery	Number of patients
Revision surgery	32
Iatrogenic dural tear	14
Distics	6
Wrong level exploration	16
Traction injury (nerve)	3

So the final result shows that 95% had satisfactory outcome. Because the revision surgery was done in 32 patients out of 650.

Hospital stay

Mean hospital stay in first 30 cases was 2.63 days and in last 30 cases was 2.82 days. Mean hospital stay increased in our last 30 cases because of few patient who had infection had to stay in the hospital for 2 weeks. If we exclude these patients who had infection our mean hospital stay drops to 2.35 days as compared to the stay of initial 30 cases. And shorter stay is required because shorter stay less the hospital acquired infections.

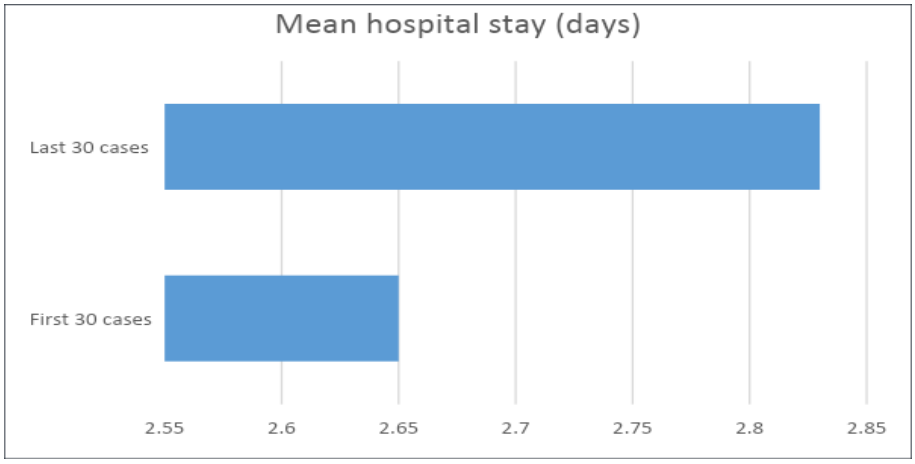


Figure 3: Mean hospital stay in first 30 cases was 2.63 days and in last 30 cases was 2.82 days.

DISCUSSION

Minimally invasive procedures have evolved over the past decade as the lumbar discectomy gold standard procedure. Our research tried to find out if microdiscectomy with caspar retractor has any significant advantage over traditional fenestration surgery for the patient. Our results show that the post-operative change benefit is small. Microdiscectomy with caspar retractor through a paramedian incision in lumbar disc surgery has many benefits including shorter hospital stay, less tissue damage, and early recovery. The procedure's surgical outcome depends on clinical experience and treatment at the correct level. Both patients were pain-free soon following surgery. It took revision surgery for 32 patients. 14 patients suffered from iatrogenic tear. 6 patients suffered from discitis. In 16 patients in whom the nerve root was not strong, incorrect stage exploration occurred, and the next level was found to be pathologically intraoperative. A percutaneous endoscopic exploration was performed in the affected disc space, but there was no conclusive pus within the intervertebral disc and no significant bacterial growth in the specimen culture. Invasive surgery as follows it retains natural paraspinal structures more thoroughly during surgery and decreases postoperative pain, which typically allows early discharge, and it can be achieved under local anesthesia.[13-14] Stabilizing structure damage such as paraspinal muscle in the endoscopic group has been significantly reduced. During microdiscectomy, it was proposed that muscle dissection and removal of posterior components, such as lamina and facet joint, increase the risk of post-operative back pain.[15-16] The more resection of the components of the spinal canal is prevented, the less discomfort caused by surgery.[17-18] Tureyen[19] compared the findings of single-sided, single-sided, first-time lumbar disk herniation treated with and without microscope treatment in 114 patients followed up for 1 year. They found this process had a success rate of 90% while traditional surgery had a success rate of 89%. Our study's drawback is that it's not a randomized trial. Microendoscopic discectomy is an alternative to traditional microscopic lumbar discectomy and is one of the treatment modalities for lumbar disc disease. The following results have been compared with other published series: (I) mean hospital stay; (II) time taken to return to work; (III) learning curve; (IV) complications; (V) revision surgery; (VI) recurrence. For different series, the success rates for microdiscectomy ranged from 88% to 98%.[20] This series shows that endoscopic lumbar discectomy is one of the approved surgical procedures that provides lumbar discectomy with a safe, efficient and minimal access technique. The procedure also enables early postoperative recovery with cosmetic scar mark and a quicker return to work time. The limitations of this study are that a learning curve and instrumentations are required for the procedure. However, according to our experience, with a short span of training and practice, it can be very well reproducible.

CONCLUSION

Microdiscectomy with caspar retractor through a parame dian incision in lumbar disc surgery has many benefits such as shorter hospital stay, less tissue damage and early recovery. The procedure also enables early postope rative recovery and a faster return to work. Our findings are very positive and encouraging we expect this technique will become the new 'gold standard' for lumbar disc surgery in a few years.

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