

Recurrent Lumbar Disk Herniation

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INTRODUCTION

Management of lumbar disk prolapse varies from observation, aggressive medical management, physiotherapy, percutaneous procedures on the disk, minimally invasive spinal surgery (microscopic and endoscopic discectomy) to more aggressive surgical procedures, like laminectomy and discectomy, anterior lumbar discectomy and fusion procedures. Single level discectomy is associated with good outcome, especially in properly selected cases. Success rates of 76 to 93% have been reported. However, discectomy-related complications too have been reported varying from 15 to 30%. The rate of recurrent disk herniation after lumbar discectomy is 5 to 15% and is the commonest reason for re-surgery. With an increasing incidence of disk herniations and surgery for the same, spinal surgeons are increasingly called upon to address the issue of recurrence.

ETIOPATHOGENESIS

Recurrent disk herniation has been defined as the presence of herniated disk material at the same level, ipsilateral or contralateral, in a patient who has experienced a pain-free interval of at least 6 months since surgery. Although, the time interval has been a point of controversy between the various authors, there is consensus in the presence of a pain-free interval after surgery. Numerous risk factors have been studied to identify those associated with recurrence. Some of the factors which have been identified with recurrence are: (1) diabetes mellitus—apart from longer hospitalization and higher risk of postoperative infection in diabetics, fewer proteoglycans have been noted in the disk which may lead to higher susceptibility to disk prolapse in this group, (2) endoscopic discectomy due to its two-dimensional visualization may be associated with higher recurrence according to some authors, (3) limited discectomy was also associated with more recurrence compared to more aggressive discectomy, (4) unrecognized lateral recess stenosis was also reported in many cases to add to the radiculopathy. Patient's age, sex, smoking habits, level of disk herniation and duration of symptoms were not associated with higher rates of recurrence. Another controversial risk factor, shape of the disk itself, does not seem to play any role.

IMAGING

Clinical presentation of recurrent disk is not particularly different from primary disk herniation. Radiculopathy is the commonest mode of presentation. Imaging in recurrent disk, however, is more complicated and difficult to interpret. The current neuroimaging tool of choice is Gd-enhanced MR imaging to investigate postdiscectomy recurrent symptoms. Optimal evaluation requires that imaging be done within 5 minutes of contrast injection. The endplates and adjacent bone marrow exhibit low signals on T1 and high signal on T2-weighted images suggesting inflammation. The anterior epidural space behind the involved disk, reveals an increase in soft tissue, tissue disruption, edema and hemorrhage with mass effect. Nerve root and facet joint enhancement with contrast is normal in these patients. It is essential that imaging differentiates a recurrent disk from scar tissue as the treatment option rests on this. Although, both these demonstrate similar signal intensities, contrast enhancement on T1-weighted sequence is seen in scar tissue due to its vascular supply unlike a disk which is avascular. Retraction of the dura toward a soft-tissue mass suggests a scar while displacement away from it, is suggestive of a disk. Discordance between imaging and intraoperative findings is more common in these patients.

MANAGEMENT

Once recurrent disk is established by imaging, treatment options include observation, aggressive medical management (in the form of pharmacotherapy and physiotherapy) and finally surgical intervention. Percutaneous procedures

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like chymopapain injection, intradiscal electrothermal coagulation, etc. are not recommended as the annulus is no longer intact in these patients. Exercising the surgical option should be done only when other modes have failed or patient's neurological status demands it. An eminent gynecologist had once remarked: 'Do not take on the complications of other surgeons until you reach a sufficiently recognized status and repute. Otherwise all the failures and complications in the patient will attributed to the last surgeon'. Although, the remark may be pessimistic, it reflects the surgeon's philosophy that surgery on these patients should be approached with caution and only after other options have been exhausted. If surgical intervention has been decided, it is imperative that the previous operation records and present imaging are studied in detail to know the extent of bone removal and if there was any previous dural tear or CSF leak or root injury. A conversation with the previous surgeon will be invaluable and usually give all this information. Unfortunately peer competition and unhealthy attitudes may prevent this from both the sides. It is also important to impress on the patient the technical difficulties that may be encountered and higher complication rate so that the patient's expectations are not unrealistic. Surgical management procedures include revision discectomy alone or combined with fusion procedures, such as transforaminal lumbar interbody fusion (TLIF), posterior lumbar interbody fusion (PLIF), posterolateral fusion (PLF) and anterior lumbar interbody fusion (ALIF). Revision discectomy alone is usually effective in most cases of recurrent disk and has a satisfactory rate of up to 88.9%. Fusion procedures decrease incidence of postoperative backache, mechanical instability and re-recurrence. However, they are more time consuming and technically more difficult in an already operated case. The revision surgery is started from the same scar but may be extended. The muscle exposure too should be wider and longer so that normal anatomy is seen. Dissection is started from the normal areas to the abnormal area. Bone removal is done on all sides—vertically and laterally so that normal dura is visualized. After this, the epidural scar tissue is carefully excised with sharp dissection using the operating microscope. Up-biting Kerrison punches are preferred by the author especially on the lateral aspect. It may be a good idea to first identify the pedicle and move medially. Once the bone removal is complete, the dura is carefully dissected away from the scar tissue and the underlying disk using sharp dissection. Sometimes, this is not possible and then the author prefers to enter the disk from the unaffected side and clear the disk partially thereby decompressing the theca. Once this is achieved, the affected and adherent dura will usually separate and discectomy and decompression of the affected root may be achieved more easily. Dural tears and CSF leaks are quite common in re-surgery. A primary closure of the dura is attempted or a duraplasty is performed using the thoracolumbar fascia and fibrin glue. The entire dura is then covered with free fat graft. If the facet joints have been violated during bone removal, a fusion procedure is also performed. Closure is done as usual with a drain if required. Postoperative complications, such as neurological deficits, CSF leak, instability, mechanical back pain, infection, deep vein thrombosis, etc. have been noted to be higher in revision surgery. A poor psychological profile was also found to be associated with an increased risk of failure in reoperated patients. Prevention of recurrent disk prolapse is always better than revision surgery. The author is conservative with discectomy (entering the disk) but radical in disk material removal. The objective of disk surgery is root decompression! If the same is achieved by just removal of the offending agent like a sequestered disk or hypertrophic bone then entering the disk is not advisable, especially if the disk bulge is not significant and the annulus tear is small. However, if the disk is entered, then it is the author's practice to radically remove as much disk material as possible. This reduces the incidence of recurrent disk herniation. Postoperative back exercises, reduction of obesity, alteration in life style and avoidance of precipitating factors all go a long way in the prevention of recurrence.

CONCLUSION

Revision surgery for recurrent lumbar disk herniation can be challenging to most spinal surgeons and this exercise should be carried out after careful planning and imaging. Surgical principles as enumerated above should be followed along with meticulous technique.

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