The Essence of Clinical Practice Guidelines for Lumbar Disc Herniation, 2021: 5. Prognosis

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Prognosis

Summary

- Surgical treatment of lumbar disc herniation generally has a favorable prognosis, but patients requiring reoperation are not rare. The most common reason for reoperation is recurrence of herniation, and the rate of reoperation for recurrent lumbar disc herniation increases as the follow-up duration becomes longer.
- Severity of leg paralysis before surgery and rate of spinal canal stenosis before surgery are risk factors for prolonged leg paralysis.
- Regarding return to work or sports, there are no major differences in the return rate between surgical and conservative treatment, including patients who undergo surgical treatment after undergoing other treatment procedures.
- To summarize a recent systematic review on factors that affect the results of surgical treatment of lumbar disc herniation, younger age, better mental health, higher preoperative visual analog scale (VAS) for leg pain, and absence of workers' compensation are factors that improve clinical results including pain; activities of daily living, and smoking, concomitant diabetes, protruding type, increased disc height, and segmental range of motion are risk factors for recurrence.

Commentary

1. What are the rates of recurrent lumbar disc herniation and reoperation?

By surgical procedure, the rate of symptomatic recurrent lumbar disc herniation was 0%-23.1% after standard discectomy, 0%-23% after microdiscectomy, 1.6%-6.1% after endoscopic discectomy, and 0%-12.5% after full-endoscopic discectomy[1-24]. The reoperation rate for recurrent lumbar disc herniation tended to increase as the follow-up duration became longer; the cumulative incidence was 0.5%-4.0% at 1 year after surgery, 1.6%-9.6% at 2 years after surgery, and 1.5%-8.5% at 5 years after surgery. There are two systematic reviews on differences in the reoperation rate for recurrence among various surgical procedures. The first review concluded that there are no differences in the recurrence rate among full-endoscopic, endoscopic, and standard discectomy[4]. The other review concluded that the recurrence rate after a minimally invasive procedure was higher[3].

The cumulative reoperation rates including various reasons at 1, 2, and 5 years after surgery were 0.6%-7.4%, 8.0%-10.5%, and 2.4%-13.4%, respectively[11,12,16,17,25-30].

2. Is surgical treatment effective to improve severe neurological deficits accompanied by drop foot or bladder and bowel dysfunction?

Severe neurological deficits accompanied by drop foot are improved following surgical treatment in ～40% (25%～64%) of cases; however, the neurological recovery after surgery is not sufficient when time to surgery takes a long time from the onset of paralysis[31]. Clinical results are not affected

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by time to surgical treatment as long as surgery is performed within 1 month after the onset, but surgical treatment after a certain length of time after the onset brings about a smaller improvement. Some reports have shown a better improvement of paralysis in patients who underwent surgery within 35 days after the onset of paralysis than in those who underwent surgery 69 days after the onset, and other reports have shown no symptomatic improvements with surgery performed more than 70 days after the onset of paralysis.

Although the level of evidence supporting the surgical treatment of severe neuropathy is low, the efficacy of surgical treatment is inarguable as the recovery rate in the surgical treatment group was higher than that in the conservative treatment group[31,32].

In patients with severe neurological deficits accompanied by bladder and bowel dysfunction, urination and defecation disorders remain after surgical treatment in ～40% (13.3%～90%) and ～50% (10.5%～90%) of patients, respectively. Bladder and bowel dysfunction was improved after surgery in only about 50% of lumbar disc herniation patients with severe paralysis (cauda equina syndrome)[33].

3. What percentage of patients can return to work after treatment?

The return-to-work rates 3 months, 1 year, and 8 years after surgical treatment are 44.4%-100%, 72%-89.9%, and 82.5%, respectively[34-40]. There are no major differences in the return-to-work rate between surgical and conservative treatment. Factors that have negative effects on the return-to-work rate include long preoperative sick leave[36,40], smoking[36], female sex[38,40], advanced age[38], psychiatric comorbidity[34,38], lower education level[34], lower subjective prognosis of gainful employment[34], history of lumbar disc herniation[34], concomitant chronic illness[34,38], and residual pain and dysfunction after surgery[39]. Minimally invasive surgery is associated with a higher return-to-work rate and a shorter length of time to return to work than standard surgery[41,42].

4. What percentage of patients can return to sports after treatment?

The return-to-sports rates after surgical and conservative treatment are about ≥80%, with no significant differences between the treatment methods[43-47]. The length of time to return to competition ranged widely from 1 month to 1 year (season)[44]. Other postoperative return-to-sports indices were a return-to-competition rate of 78%-89%, an interval of return to competition of 1 month-2.4 years (seasons), and a length of time to retirement from competition after return of 1.2-5.2 years, ranging widely depending on specific areas of competition and surgical procedures, except for the return rates, which were higher than 80% in general[44,48,49].

5. Does the prognosis depend on specific postoperative treatment procedures?

Rehabilitation programs undergone after surgery have been reported to bring about good short-term functional improvements in the intensive training group; however, the effects do not last for a long term[50-53]. All of these studies reported that rehabilitation did not increase the hernia recurrence rate. Return-to-work guidance is effective to improve the employment rate[54,55]. This commentary is essentially a reproduction of the review in the previous edition, because no new papers relevant to this BQ after publication of the previous edition were found.

6. What factors affect the prognosis of surgical results?

Factors that affect the surgical results have been studied from various angles, such as patient background, radiological findings, and psychosocial factors, and a large amount of evidence has been accumulated. In this BQ, we reviewed factors reported in these articles after classifying into the following four categories: ① Confident: There are at least two high-quality studies providing supportive evidence and no high-quality articles providing counter evidence; ② Almost confident: There are at least two high-quality studies providing supportive evidence and one high-quality article providing counter evidence; ③ Probable: There is one high-quality study providing supportive evidence; and ④ Insufficient evidence: There are at least two high-quality studies providing supportive evidence and at least two high-quality articles providing counter evidence.

Among physical factors, insufficient evidence was available for relationships of advanced age[56], body mass index (BMI)[56], and sex[56] with clinical results, but younger age[56,57], short duration of illness (<6 months)[56,58], better mental health[56], and higher VAS leg pain score[56] were factors that improved clinical results such as pain and activities of daily living. Among social factors, long sick leave[56] and being related to workers' compensation[56] were confident factors associated with poor prognosis. Among radiological factors, sequestration type[56] and extrusion type[56] were almost confident factors associated with good prognosis, and contained type[56] was a confident factor associated with poor prognosis. As factors associated with recurrent lumbar disc herniation, age[59], work contents[59], and BMI[59] had insufficient evidence, and smoking[59-61], protrusion type[59], concomitant diabetes[59], increased disc height[12,61,62], and increased segmental range of motion[12,61] were confident factors.

7. Are there any procedures that have effects on the postoperative progress?

Improved methods and various devices for intraoperative procedures and anesthesia procedures have been developed to improve postoperative results; however, many of these treatment methods are not approved in Japan.

Conflicts of Interest: The author declares that there are no relevant conflicts of interest.

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