

Direct repair of lumbar spondylolysis

Direct repair of the defect in spondylolysis has been performed on 12 patients with a mean age of 29 years. With an average follow-up period of 3 years, 8 patients had a good result, 2 patients improved only slightly and 2 patients remained unchanged.

Geert J. I. M. van der Werf
Alphons J. Tonino
Willem S. Zeegers

Department of Orthopaedic Surgery, De Wever Ziekenhuis, Heerlen, The Netherlands

Correspondence: Department of Orthopaedic Surgery, Diaconessenhuis, Postbox 80250, 3508 TG Utrecht, The Netherlands.

In spondylolysis with chronic back pain, fusion of two or more vertebrae is commonly performed. However in cases without degenerative changes, direct repair of the lesion itself (Buck 1970, 1979) seems an attractive alternative. We have used this method in 12 patients.

Patients and methods

In the period 1981-1982, 9 men and 3 women underwent a direct repair of the defect in spondylolysis of the lumbar spine. The average age at the time of operation was 29 (16-39) years. The lesion was located at the fifth lumbar vertebra in nine patients and at the fourth lumbar vertebra in three. In one patient only, a unilateral defect was diagnosed. The indication for operation was persistent disabling low back pain, which did not respond to conservative treatment and had lasted longer than 1 year. Only patients obtaining significant pain relief from wearing a plaster-corset including one thigh for several weeks were considered candidates for surgery, and only spondylolysis and lytic spondylolisthesis with a minimal displacement not exceeding 3 mm as seen on standing radiographs were accepted. No signs of neurological involvement were seen. Preoperatively, all patients had normal discography and none had radiographic degenerative changes of the lumbar spine.

The operative technique was as described by Buck (1970). Postoperatively the patient was placed flat on his back for 5 days. Then a Baycast plaster corset which included one thigh was applied and full mobilisation was allowed. The cast was removed after 4 months. Sports and strenuous work were not recommended until after 6 months.

A follow-up examination was performed with a median observation period of 3 years (Table 1).

The result was graded as good when there was little or no lumbar pain, which did not interfere with daily activities, including sports and strenuous work. In cases classified as fair there was only a slight improvement of the preoperative complaints, which however did not affect light daily activities. In cases rated as poor there was no alteration at all. The radiographs were reviewed with regard to consolidation and secondary changes.

Results

At follow-up, 8 of the 12 patients had a good result. All of them resumed their previous occupation within 6-8 months and participated in sports without any restriction. Two patients were graded fair. In one of them (Case 8) a reoperation was performed after 2 years because of persistent pseudarthrosis. Two patients re-

Table 1. Results of direct repair of lumbar spondylolysis.

Case	Sex	Age	Level	Slip (mm)	Follow-up (years)	Result
1	M	33	L 5	0	3.5	Good
2	M	22	L 5	2	3.4	Good
3	M	34	L 5	1	3.3	Good
4	M	26	L 5	1	3.1	Fair
5	M	39	L 5	0	3.0	Good
6	M	37	L 4	0	2.9	Good
7	F	21	L 4	1	2.9	Poor
8	M	34	L 5	0	2.7	Fair
9	F	25	L 4	0	2.6	Poor
10	M	19	L 5	3	2.3	Good
11	M	31	L 5	0	2.3	Good
12	M	16	L 5	1	2.1	Good

Case 5 unilateral. All radiographically healed except Cases 8 and 9.

mained unchanged and were rated as poor; in Case 7 there was no obvious explanation for a poor outcome, and in Case 9 there was a pseudarthrosis due to a technical failure.

Consolidation within 4–7 months was demonstrated radiographically in 10 patients. Loosening of the screws occurred in the two cases which developed a pseudarthrosis.

Discussion

Spondylolysis, with or without vertebral slipping, may cause low back pain. Vertebral slipping does not always occur and progression after the second decade is rare (Wiltse 1961, Frederickson et al. 1984).

It must be emphasized that in most of the patients significant symptoms never develop and that the defect *per se* is not an indication for surgical intervention. In the symptomatic group the vast majority can be treated conservatively. In the small group of patients not responding to this, we believe there is an indication for surgery. In cases of significant forward slipping with associated degeneration of the underlying disc, an operation based on fusion of two or more vertebrae is the generally accepted strategy. However, in the younger patient with spondylolysis, eventually with a minimum of forward slipping and with an intact disc, restoration of the anatomy by direct repair of the lesion in the pars interarticularis is a more logical step. Like Buck (1970) and Buring & Fredensborg (1973) we have ac-

cepted a forward slip of not more than 3–4 mm as seen on lateral standing roentgenograms. Another prerequisite in our series was a normal underlying disc, as proven by discography. The value of this protocol was illustrated by the fact that in the same period two patients had to be excluded from a direct repair procedure because of a pathological disc which was first revealed at discography.

We graded 8 of our 12 patients as good. Buck (1979) reported a success rate of 88 per cent in 75 cases and Buring & Fredensborg (1973) rated 9 patients out of 12 as good.

Although the results of direct repair are not better than those obtained by techniques based on spinal fusion, we would nevertheless recommend this method as a logical and less drastic alternative.

References

- Buck, J. E. (1970) Direct repair of the defect in spondylolisthesis. Preliminary report. *J. Bone Joint Surg.* **52-B**, 432–437.
- Buck, J. E. (1979) Further thoughts on direct repair of the defect in spondylolysis. *J. Bone Joint Surg.* **61-B**, 123.
- Buring, K. & Fredensborg, N. (1973) Osteosynthesis of spondylolysis. *Acta Orthop. Scand.* **44**, 91.
- Frederickson, B. E., Baker, D., McHolick, W. J., Yuan, H. A. & Lubicky, J. P. (1984) The natural history of spondylolysis and spondylolisthesis. *J. Bone Joint Surg.* **66-A**, 699–707.
- Wiltse, L. L. (1961) Spondylolisthesis in children. *Clin. Orthop.* **21**, 156–163.