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An observational study on the outcome after surgery for lumbar disc herniation in adolescents compared with adults based on the Swedish Spine Register

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Introduction

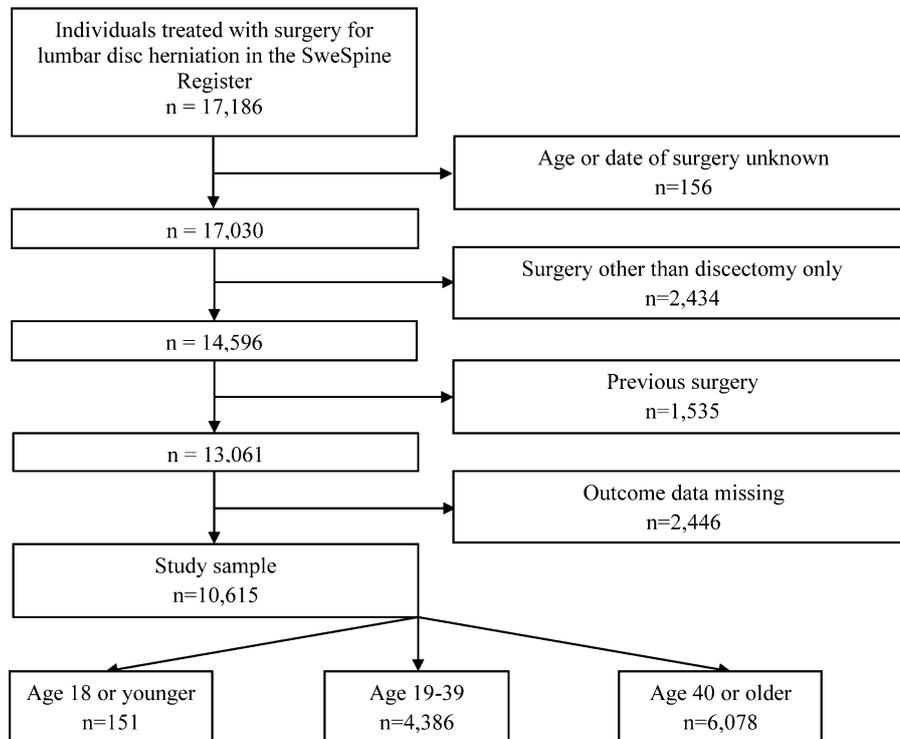
Disc-related sciatica has a prevalence of about 2% in adults, but is rare in adolescents(1). There have been only a few studies on lumbar disc herniation in children and adolescents, and all are retrospective(2-10). The time from onset of symptoms to diagnosis and surgical intervention is longer among adolescents than among adults(4, 11). This time could possibly be shortened if clinicians felt more confident in identifying and surgically intervening in cases of symptomatic lumbar disc herniation in adolescents.

We hypothesized that adolescents have a similar outcome of surgery as adults. In this study, based on prospectively collected data from the Swedish Spine Register (SweSpine), we compare the short term outcomes after surgery for lumbar disc herniation in adolescents with adults.



Material and methods

This study included 151 patients, aged 18 years or younger, 4,386 patients aged 19-39 years and 6,078 patients aged 40 years or older, followed for 1-2 years after surgery.





Outcome measures and statistics

The primary outcomes were patient satisfaction and global assessment of back and leg pain. Secondary outcomes were visual analog scale (VAS) back pain, VAS leg pain, Oswestry Disability Index (ODI), and EuroQol 5-Dimensions (EQ-5D).

Statistical analyses were performed with the Welch F-test, the Chi-square test, and the Wilcoxon test.

Results

At follow-up, the adolescent group had better results than the adult groups in all outcome variables (Table 1 and Table 2).

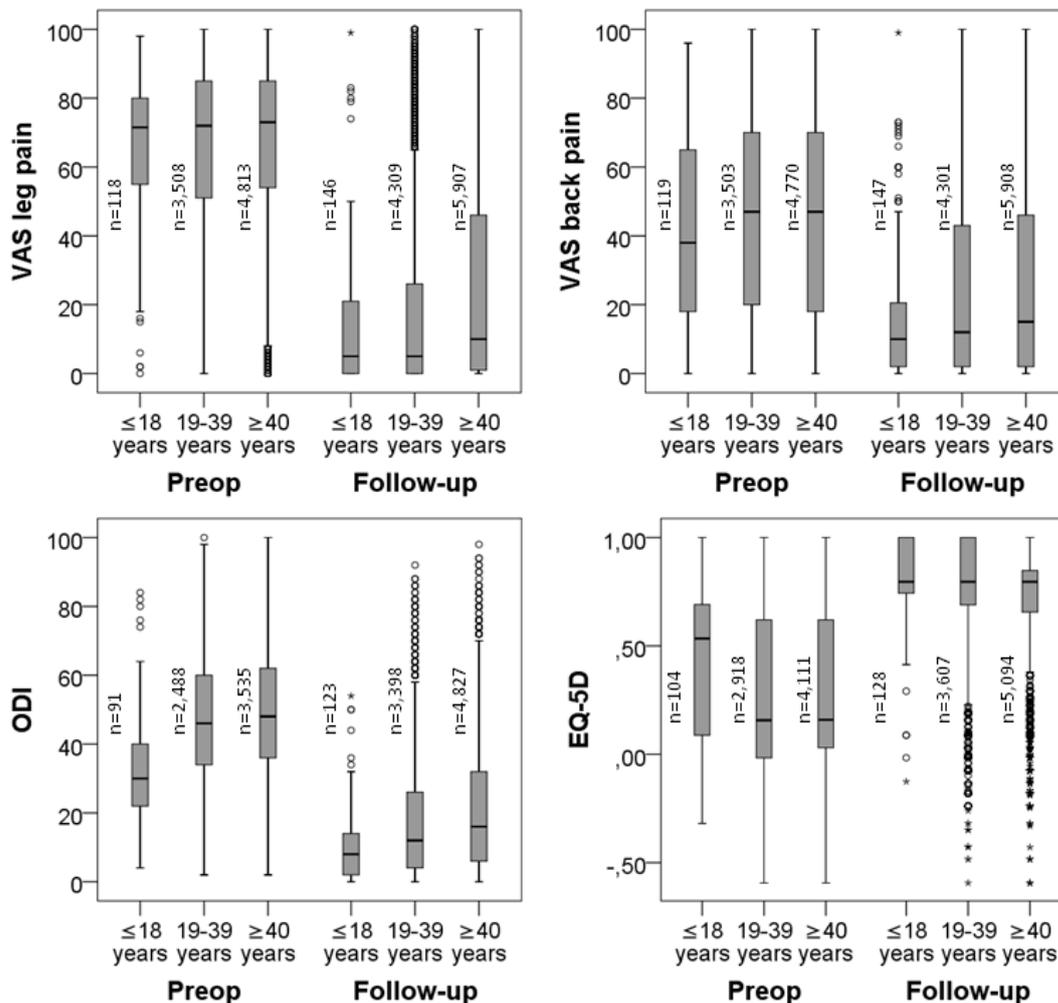
Table 1. Satisfaction and global assessment one to two years after surgery. Data are given as number (%). Unadjusted P-values are given for the Pearson Chi²-test, and adjusted p-values for analysis of covariance after adjustment for sex, smoking, type of disc herniation and duration of preoperative leg and back pain for the differences between the three groups. Numbers in the table do not always correspond to group numbers due to missing data.

	Age ≤18 years (n=151)	Age 19-39 years (n=4,386)	Age ≥40 years (n=6,078)	Unadjusted p-value	Adjusted p- value
<i>Satisfaction</i>					
Satisfied	128 (86%)	3,362 (78%)	4,479 (76%)		
Uncertain/dissatisfied	21 (14%)	925 (22%)	1,436 (24%)	p<0.001	p=0.043
<i>Global assessment leg pain^a</i>					
Pain free/Much better	130 (87%)	3,337 (78%)	4,191 (71%)		
Somewhat better/unchanged/worse	20 (13%)	951 (22%)	1,691 (29%)	p<0.001	p<0.001
<i>Global assessment back pain^b</i>					
Pain free/Much better	120 (88%)	3,025 (73%)	3,959 (70%)		
Somewhat better/unchanged/worse	17 (12%)	1,108 (27%)	1,714 (30%)	p<0.001	p<0.001

^aThere were 0 adolescents, 43 younger adults and 94 older adults that did not experience leg pain before surgery.

^bThere were 12 adolescents, 189 younger adults and 312 older adults that did not have back pain before surgery.

Table 2. Comparison of secondary outcomes preoperatively and at follow-up. The Welch F-test was used for group comparisons and the Wilcoxon signed ranks test was used for changes within groups. Preoperatively, adolescents had similar VAS leg pain ($p=0.37$) and VAS back pain ($p=0.18$), while ODI was significantly lower ($p<0.001$) and EQ5D was significantly higher ($p<0.001$) when compared to the adult groups. All groups experienced significant improvement ($p<0.001$ for all comparisons). At follow-up, adolescents had significantly lower VAS leg pain, VAS back pain and ODI, and higher EQ-5D than the adult groups ($p<0.001$ for all comparisons). The boxes show median and interquartile ranges; inner fences represent minimum and maximum values, or 1.5 times the interquartile range. Outliers are indicated. n=number of patients available in each group.





Limitations

This study has at least three major limitations; the lack of a non-surgically treated group, the short term follow-up, and the lack of validated questionnaires for adolescents. There is however a long term follow-up in progress.

Conclusions

Surgery for lumbar disc herniation among adolescents gives a high rate of satisfaction, which was even higher than in adults. There was a clinically relevant improvement in all age groups, but patients still did not reach the level of the general quality of life in the normal population. Future studies should include comparison between conservative treatment and surgery for adolescents, as well as longer-term follow-ups. However, surgery for lumbar disc herniation in adolescents, with the same indications as for adults, could be considered as an effective option to conservative treatment.



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Disclosure declaration

All authors have completed the ICMJE uniform disclosure at www.icmje.org/coi_disclosure.pdf and declare:

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