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Timing of surgery for sciatica

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SUMMARY & CONCLUSION

SUMMARY

Background

Although sciatica is as old as mankind its cause remained unknown throughout the centuries. The typical symptom complex of a diseased lumbosacral nerve root was not correlated with an anatomical substrate until some 75 years ago. The cause is a disk herniation, an entity which can easily removed be treated surgically but appears susceptible to spontaneous cure as well. Although surgery seemed to be the preferred method of cure for persistent sciatica from 1934 on, the optimal time of execution remained unknown (**Chapter 1**). A review of literature presented the state of the art in epidemiology, diagnosis, conservative and surgical treatments for sciatica caused by a disk herniation. The clinical diagnosis is based on descriptive criteria and only needs radiological affirmation of nerve root compression before further invasive treatment is discussed. (**Chapter 2**). The review concluded with uncertainties around the appropriate conservative or surgical treatment for disk herniation related sciatica. For a disease with such a high incidence, societal impact and internationally varying surgery rates, it is amazing to realize that the 6 weeks “wait-and-see” period is based on empirical medicine without any substantial evidence.

Objectives and design of the trial

After evaluation of the existing scientific literature it was clear that, with concern to the superiority of ‘relative’ early timing of surgery, no evidence supported this strategy for most patients with 6 to 12 weeks of non-remitting sciatica. Besides this fact no prospective trial had been performed yet with the goal to estimate the economic and societal impact of disk surgery compared to prolonged conservative care. For this reason a randomized trial protocol had to be developed, to answer the question whether early surgery would effectively speed up recovery and if this strategy was cost-effective compared to prolonged conservative care. A third objective was to estimate the effect of early surgery on speed of recovery and 1 year outcome for predefined subgroup variables.

The design of The Sciatica Trial with subsequent NWO/ZonMW grant approval lasted 2-3 years, including considerable methodological struggle but with the gain of epidemiological knowledge. Background, methods and design of analysis of this trial were described in detail (**Chapter 3**). To answer the question whether early surgery, after 6 to 12 weeks of sciatica, is an effective treatment, this strategy would have to be compared randomly with prolonged conservative care and eventual delayed surgery among at least 280 patients. To accrue enough patients with an unequivocal radicular syndrome, 9 regional hospitals in Holland participated in the study after approval of the protocol by the Medical Ethics Committee. The protocol included a

conservative treatment recommendation for participating family practitioners, who guided those patients allocated to prolonged non-surgical treatment group.

Key findings

Although relief of complaints was twice as fast for sciatica patients who underwent early surgery, this multicenter randomized trial (n=283) demonstrated that this strategy did not result in a better overall 1-year functional recovery rate when compared with a policy of prolonged conservative treatment with eventual delayed surgery. During one year 89 percent of patients in the early surgery group and 39 percent of the conservative treatment group underwent microdiscectomy. At one-year follow-up no significant differences were detected in mean scores for any outcome measurements, including leg pain. Thus, the major advantage of early surgical treatment remained the faster relief of sciatica. The study results indirectly provide individual patients with sciatica who are considering disk surgery with information about how early surgery and conservative treatment affect the three separate outcome parameters, i.e. disease-specific disability, intensity of leg pain and time to recovery. (**Chapter 4**).

Faster recovery from sciatica makes early surgery more likely to be cost-effective than prolonged conservative care. The estimated difference in health care costs was acceptable and was compensated by the difference in absenteeism from work. For a willingness to pay \$50,000 or more per Quality Adjusted Life Year, early surgery need not be withheld for economic reasons. (**Chapter 5**).

Except for “sciatica provoked by sitting” early surgery compared to prolonged conservative care yielded significantly faster rates of recovery for all investigated variables. If patients were able to sit without provoking sciatica early surgery did not result in faster recovery compared to conservative treatment. In contrast to former beliefs the straight leg raising test and morphology of the disk herniation failed to affect the short-term speed of recovery by early surgery versus prolonged conservative care. (**Chapter 6**). Higher initial disability scores and intensity of leg pain scores were found to have a predictive value for the probability for delayed surgery (39 %) in a cohort of 142 patients during a strategy of prolonged conservative care. Surgery after 6 to 12 weeks of sciatica may continue to be a valuable tool for those patients with continuous pain of high intensity and high disability scores as a sign of severe sciatica (**Chapter 7**). We have demonstrated unequivocally that female gender is an independent predictive determinant for an unsatisfactory outcome at one year after a 6 to 12-week period of severe sciatica irrespective of surgery. (**Chapter 8**). The estimated odds for a long-term poor outcome were 3.3 higher for female patients with sciatica than for males and this finding was statistically highly significant. In addition females exhibited a slower recovery from sciatica. Irrespective of treatment the pro-

portion of patients with a good outcome was 87 % at one year. Since this is the actual state of the patients at 12 months, this proportion is lower than the 95 % perceived recovery during the first year as indicated by survival analysis. The mean disability and pain scores of patients with an unsatisfactory outcome at one year in this trial represent painful and disabling suffering. Quantification of the degree of failure has not yet been reported before.

During analysis of 2-year follow-up data, both strategies, early surgery and prolonged conservative care, resulted in similar outcomes at two years but early surgery achieved more rapid leg pain relief. Prolonged conservative care for 6-8 months was safe and did not result in a higher proportion of unsatisfactory outcomes at two years. **(Chapter 9)**. Remarkably, early surgery did not prevent the risk of an unsatisfactory outcome at 1 or 2 years. In our study 20 % of the patients suffered chronic pain after a first episode of sciatica. Those with unsatisfactory outcomes scored worse on all outcomes corresponding to grave disability.

CONCLUSIONS

The optimal timing of surgery for sciatica cannot be defined for all patients, it remains a personal choice. After the classical guideline threshold of 6 to 12 weeks nature is still able to cure sciatica in a considerable proportion (60 %) of patients during the following months. Early surgery resulted in a recovery twice as fast compared to conservative care. From a cost-utility perspective data analysis showed that early surgery is an acceptable treatment. To operate on all patients without recovery in the first 3 months, however, would lead to unnecessary interventions, unless patients are aware of the potential alternatives for a favorable natural course. There were no clinical or imaging predictors of which patients would do better with surgery, although the presence of leg pain provoked by sitting was a potential determinant. Moreover, more intense leg pain and disability resulted in a higher chance on delayed surgery during a strategy of conservative care. Surgery could not prevent grave disability, which cripples 20 % of patients at 2 years irrespective their treatment. Future research will address this problem of chronic disability in this minority of patients, which has received only minimal attention in the past. **(Chapter 10)**.

Physicians are now able to provide their patients with realistic data about the different courses of sciatica and thus indirectly to enable them to choose surgery or conservative treatment on an individual basis.

