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Minimally Invasive Repair of Pectus Excavatum

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Summary

This thesis contains the results of the evaluation of surgical minimal invasive repair of the pectus excavatum (MIRPE) in the Netherlands.

The main aim was to achieve further insight in the effect this operative treatment has on adolescent patients. The study includes the period before and after the surgical procedure. Even with the MIRPE technique being practiced in the Netherlands since 1999, evaluations have mostly focused on the strict peri-operative period and specific surgical technique. The period before surgery where adolescents decide if they want an operation and the period after surgery extended after the first years is hardly studied in a longitudinal fashion. However this longer follow up could be helpful to find variables that affect the patients wellbeing. In the first part of the thesis the health information provided by the internet on PE, the trends in surgical technique in the Netherlands and the short term effects of surgery on quality of life, pain, self-esteem and general QoL after surgery are evaluated. The latter part is focused on late results in sports activity, economic evaluation of the costs of MIRPE surgery and critical evaluation of outcome measurement SSQ.

Before adolescents embark on the way to surgery for their pectus excavatum, they search for information about their deformity and possible treatments as well as reports from others with the same chest wall abnormality, usually on the internet. Since adequate information is important to make an informed decision later in the process, we conducted a study about the overall quality of PE websites with the use of the DISCERN instrument. The findings showed a low to moderate score on quality, with extensive shortcomings and a strong need to provide unbiased good quality information. (Chapter 2)

In order to gain insight in the scale of surgical correction of PE in the Netherlands, we evaluated the figures of yearly performed and registered surgical procedures for PE, and especially the share of MIRPE in this total. The figures showed an increase in total performed surgical corrections of pectus excavatum over the last 2 decades, as well as a steady increase on the part of minimal invasive reconstruction of the PE. (Chapter 3)

In our search for variables to influence post-operative pain we examined the relationship between pre-operative measurements of the STAI-state anxiety

and pain scores 6 weeks post-operative. State anxiety only showed a significant relationship with pain scores during activity. (Chapter 4)

To further research the role of pain we performed a study whereby we focused on the relationship between early post-operative pain and quality of life after 6 weeks. Although patient satisfaction was good, pain seemed to have a negative influence on self-esteem. (Chapter 5)

Changes in self-esteem were investigated in a further study, whereby we investigated over a longer period post-operative. The outcome showed an improved body image, increased self-esteem, increased psychological resilience in the first 6 months, with the most marked change in the first 6 weeks. (Chapter 6)

The outcome after PE surgery can be measured with different questionnaires. One frequently used form is the Single Step Questionnaire (SSQ), which claims to lead to a stable score independent of the moment of recording. We evaluated the results of scores taken at different intervals post-operative and found the SSQ to be phase dependent. (Chapter 7)

Another outcome variable is the return to sport activities, since sport activities or physical exercise are frequently assumed to be lower in patients with a PE. We investigated the return to sport activities, exercise tolerance and evading behavior. Although the percentage of sport participation did not increase, the perceived problems with physical exercise were lower after surgery. (Chapter 8)

The MIRPE procedure comes at a cost. To calculate the costs of the procedure, the SF-36 was measured before and 1 year after surgery and used to calculate the SF-6D. The cost of the MIRPE procedure far exceed the acceptable costs per QALY in the Netherlands. This is caused by the underlying questionnaire which measures mostly functional changes instead of also body-image or self-esteem changes. (Chapter 9)

In conclusion, this thesis aims to further improve the care for patients with a pectus excavatum, who are operated on by the MIRPE technique, by providing longitudinal outcomes and identifying factors that need to be optimized to improve care.