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Early changes in pulmonary function following thoracotomy for scoliosis correction: the effect of size of incision

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The authors have decided to tackle the old belief that the smaller the thoracotomy incision—or the less invasive the spine surgery—the better the pulmonary function will be.

In their study it is very clear that the only difference noticed between their two identical groups of patients treated with conventional thoracotomy (group A) and the minimal access thoracotomy (group B) is a change in the early postoperative pulmonary function test at 2 weeks. At 3 months no difference could be observed in terms of functional vital capacity and forced expiratory volume. Unfortunately, no data is given for 1-year or 2-year follow-ups, but common sense and literature review should predict that no difference should be observed between their two groups.

These findings contradict the proponents of minimal thoracotomy, who argue that minimal access surgery will result in far less trauma to the chest. Newton has shown that a group with thoracoscopic-instrumented scoliotic spine has less decrease in pulmonary function than the open-thoracotomy group, although the difference tends to diminish with time [1]. Newton's findings would, therefore, prove that thoracoscopic instrumentation is less aggressive for the lung, initially, than classic open thoracotomy. However, the paper currently published deals with minimal open

thoracotomy vs conventional thoracotomy.

One can argue that one long incision of 15–20 cm (conventional thoracotomy) may seem to be equivalent to a few small incisions (two or three 7.5 cm-long incisions) or multiple thoracoscopic incisions (five to six, in the case of thoracoscopic anterior release). The required retraction and subsequent trauma to the chest to approach several thoracic levels should be compared with the trauma of multiple, small thoracotomies or small thoracoscopic incisions.

The limits of the study are that the author does not furnish other factors besides respiratory function, such as the amount of postoperative pain observed in the two groups, amount of blood loss (intraoperative and postoperative in the chest tube), surgical time difference between the two groups, possible complications in each group, and the outcome differences of the two groups. Consequently, we do not know from this study whether it is worth doing these thoracotomies in a minimal-access fashion. The other limit is that both groups underwent anterior rib-head excision and posterior spinal instrumentation with costectomies. This rib excision may be considered even more aggressive than the anterior thoracotomy and may induce flaws and account for the

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similar results on the pulmonary function tests at the 3-month follow-up.

The principal criticism of this paper concerns the indications for such an aggressive method of treatment for moderate-size curves in the adolescent age group. The mean age (15 years old) and Cobb angle (60°) of the patients reported in this series are similar to other numerous series. However, most adolescent thoracic scoliosis cases can be treated with either a simple anterior or a posterior surgery and do not require such an aggressive circumferential surgery. Doing an anterior release with rib-head excision, followed 2 weeks later by a posterior instrumentation including posterior costectomies is far from standardized

surgery in adolescent idiopathic surgery. The age group of the patients (15 years old) does not justify the need for an anterior release to prevent crankshaft. Most of the patients in the study appear to be normokyphotic (average preoperative kyphosis 21°) and, therefore, do not require anterior release. All patients had posterior costectomies, which is not always justified in this age group. The sequence of anterior release followed 2 weeks later by posterior instrumentation can only be justified if resources limit access to postoperative ICU and for very large curves (superior to 100°) that would require halo traction between the two stages. Therefore, the authors have only proven that there

is no significant change in pulmonary function between conventional thoracotomy and minimal access thoracotomy at 3 months for their sequence of treatment. Such sequence (anterior release with rib-head excision, followed 2 weeks later by posterior instrumentation and posterior costectomies) for moderate thoracic curves cannot serve as a reference for the general spinal deformity surgeon community.

References

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