The introduction of this radically different technique changed the landscape of pectus excavatum surgery, which was previously dominated by the open approach. The number of interventions for pectus deformities tripled. Because it is highly unlikely that this dramatic increase was due to the rise in the number of children born with those deformities, one must look for other explanations, such as the extensive marketing efforts of the manufacturer, the fact that a large number of Nuss operations are now performed by specialties other than thoracic surgery, and, most of all, to the public's awareness of the procedure's benefits.

The issue of surgical repair of pectus deformities has always been a controversial one. The physiological consequences of the disease, except in the most severe cases, are poorly defined, the necessity of intervention constitutes an ongoing debate and the choice of the most appropriate surgical technique remains elusive. To this already-existing controversy, recently, an entirely new issue has been added: the Nuss procedure, which by its advocates is now presented as the non-invasive ‘procedure of choice’ and the ‘gold standard’ for the repair of most, if not all, pectus anomalies [1].

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attraction to the magic words 'minimally invasive'. Those individuals, who in the past would refuse to undergo the operation, now queue up to have their deformity corrected 'without surgery'.

But, is the Nuss operation really 'minimally invasive'? Is it appropriate to label a procedure, which includes passing of up to three, foot-long heavy steel rods through both pleural cavities and the narrow space between the heart and the sternum, leaving them in place for 3–5 years, then remove them surgically, really 'minimally invasive'? Albeit it saves the patient from a more visible anterior scar, the method necessitates up to six laterally located skin incisions that are re-opened years later to remove the steel rods. Further, the resulting scars of the intervention are compared with those inflicted by the 8–12-cm longitudinal or transverse incisions of the now-defunct 'classic' Ravitch operation. Today, open repairs of pectus deformities are done with a 4–5 cm long transverse or sub-mammary exposure, the total length of which compares favorably with the multiple incisions of the 'minimally invasive' Nuss procedure.

As far as the outcomes of the two approaches are concerned, in experienced hands, the short- and mid-term results appear comparable; however, the lack of long-term, randomized, prospective trials makes the final evaluation impossible. Unfortunately, just as it is the case in the issue of skin cosmesis, the relevant literature that evaluates the anatomical and physiological outcomes of the Nuss procedure versus the open approach does not refer to any minimally invasive contemporary methods of sterno-chondroplasty as a control group, but refers to a poorly defined mixture of open operations as the 'the Ravitch method'.

Our main objection to the 'minimally invasive' Nuss procedure, or more appropriately defined as the 'closed approach', is not those mentioned above, not even the higher cost, the often extended hospitalization, the necessity of long-term close follow-up, or the need of re-operation, but its potential of serious complications. In Nuss repairs, the possibility of serious injury to vital organs begins when the operator passes the rods in the narrow space between the heart and the sternum and persists as long as they are left in the patient’s body. The rate of complications with the Nuss procedure are not more numerous, but also are of great variety and often life threatening, a phenomenon, which is seldom, if ever, seen with the conventional open approach. The relevant literature lists every possible intra-operative and late mishap, such as perforation of the heart and hemopericardium and cardiac tamponade, injury to the lungs, the aorta, to the liver, to the brachial plexus, laceration of the diaphragm, obstruction of the thoracic inlet and the caval veins, dislocation of the sterno-clavicular joint, displacement, flipping, rotation of the bar, metal allergy, stubborn postoperative pain which far exceeds that of open operations, subcutaneous emphysema, recurrent pericardial and pleural effusions, increased rate of infections, erosion of the sternum and the skin, mammary artery pseudo-aneurysm, and entrapment of the bar by neo-calcification making its removal a major intervention. While such complications may be infrequent in the hands of an experienced surgeon, such as Dr Pilegaard, their potential lingers like the sword of Damocles over the head of every operator who uses the method.

We believe that before some of the recommendations forwarded by Dr Pilegaard and co-workers can be accepted, that is, that the indication of pectus repair should now be widely extended from children to adults, that the indication may be based solely on the patient’s wishes, and on the presence of >3-cm-deep sternal depressions, we need objective evidence-based trials, which examine in depth the clinical as well as the economical aspects of this innovative procedure.

Reference