

Minimally Invasive Surgery for Scoliosis: The New Laparoscopic Cholecystectomy?

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In October 2009, a team of orthopedic surgeons at BC Children's Hospital, led by Dr. Firoz Miyanji, performed the first minimally invasive spinal surgery for scoliosis in Canada on an 18-year-old girl from Prince George.

Minimally invasive surgery (MIS) for scoliosis consists of creating small "keyhole" incisions in the back, through which screws are inserted into the joints of vertebrae.¹ Thereafter, wires are used to lay down bone grafts for fusion. Finally, through cannulated screws, a rod is fed to straighten the spine. The new procedure takes an additional 1-1.5 hours on top of 4-6 hour time required by the conventional method, in which one large incision is made and all associated muscles with the vertebrae are "stripped" for access to the joints.

Idiopathic scoliosis is the most common spinal deformity facing orthopaedic surgeons. Although the condition is not typically painful for adolescents, it is associated with long-term cardiac and pulmonary compromise and future back pain. Typically, surgery is considered in those with a curvature greater than 45-50 degrees with the aim to arrest the progression of the disease and secondarily to straighten the spine.

Due to the extensive muscle stripping involved in the traditional procedure, extensive tissue damage, junctional alignment difficulties and muscle atrophy are possible. Patients undergoing traditional surgery are also admitted to ICU and must undergo months of rehabilitation. With MIS, there is considerably less trauma to the tissues, less blood loss and no admission to ICU. Patients can walk the next day, and be discharged within 3-4 days. Potential disadvantages of the MIS procedure include longer operating time, and lack of long term evidence of efficacy. While the procedure is currently offered to patients with idiopathic scoliosis, Dr. Miyanji hopes that it can be extrapolated to other causes of scoliosis. The surgery is not recommended to those with large (greater than 70 degrees) or particularly rigid curvatures, which are difficult to manipulate with small incisions.

With MIS, the real challenges face the surgeons: "You have to know the anatomy more comfortably, because you don't know where you are putting the screws in, and it's not a big visual

field that you are seeing" says Dr. Miyanji. However, he believes that the surgery is a very "teachable item" and will gain more popularity. Dr. Miyanji is scheduled to give numerous talks on the topic across the country, and has received interest from adult spine surgeons interested in using the method in non-pediatric populations. 

REFERENCES

1. Mehlman CT. Idiopathic Scoliosis. Oct 20, 2009. Emedicine. Accessed Feb 2, 2010. Available at <http://www.emedicine.com/orthoped/TOPIC504.HTM>



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