Minimally invasive cervical spine surgery: Posterior approach revisited

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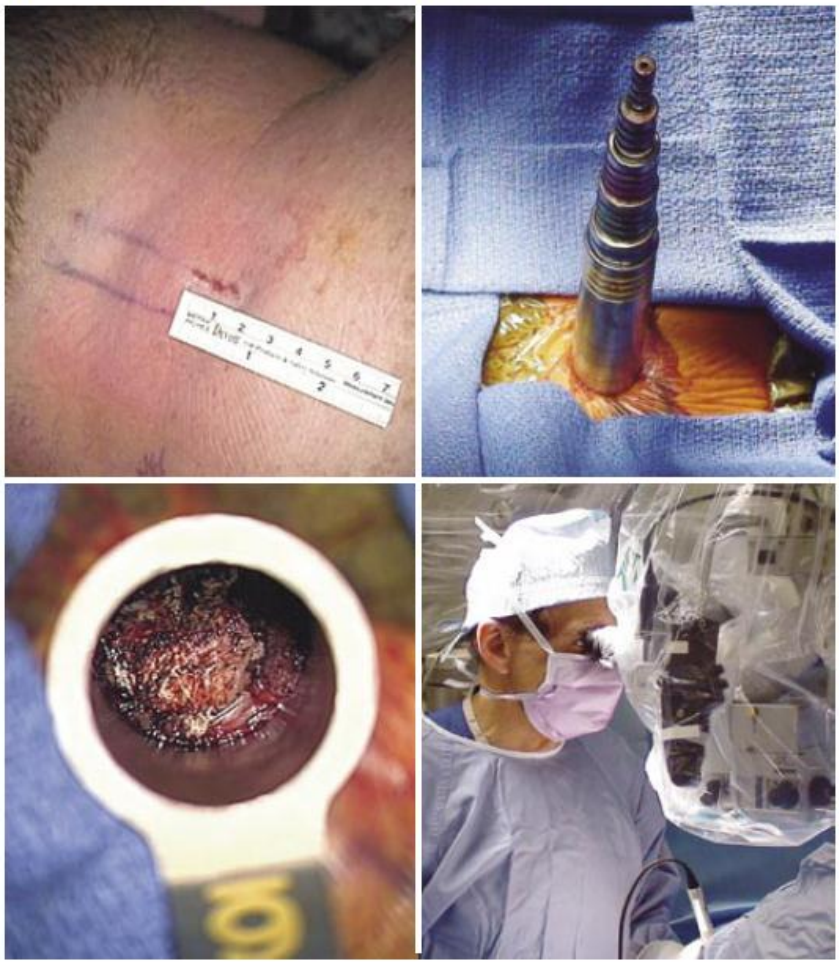
The persistent advance of minimally invasive surgery now influences all segments of spine surgery. The advantages of these approaches have in the past been outlined in the pages of this newsletter in many different forms, including; microdiscectomy, endoscopic discectomy, and percutaneous spinal fusion using mini-plates, screws and cages to stabilize the spine.

Many of these approaches benefit from the development of visualization devices, such as microscopic fiber optics and other equipment possessing advanced magnification that enables the surgeon to view tiny structures through a small portal. Additionally, advancement of the types of retractors used to dilate the skin allows for a smaller skin incision and enables the use of a muscle splitting rather than cutting approach. Thus the goal of minimally invasive surgery to provide less postoperative pain, often a faster hospital discharge and a quicker return to employment.

Posterior cervical spine surgery has recently benefited from these advancements in minimally invasive approaches. Conventional approaches to the posterior cervical spine have notoriously resulted in severe post-operative pain and muscle spasm, often delaying hospital discharge and return to work, despite improvements in arm symptoms. The older approach resulted in a larger incision and more muscle trauma which resulted in severe neck pain and limited motion, often for several weeks.

The advancement of the anterior cervical approach has been a direct result of this pain problem and has resulted in almost a complete shift of cervical spine surgery to use the anterior approach. In many cases, however, there is a natural advantage to approach the cervical spine using the posterior approach. In those patients who have had prior anterior cervical spine fusion which would require re-operation through the same fusion and scar tissue, the posterior approach would avoid this area and allow decompression of the nerves from behind. Also, in patients with an isolated focal nerve root compression exiting the neural foramen the posterior approach allows for a more focus decompression without disruption of the disc space and thereby preservation of spine motion since no fusion is required.



(*top left*) Posterior cervical incision; (*top right*) Dilating tubes used to dilate the incision; (*bottom left*) 1 cm port used for visualization; (*bottom right*) Joseph Maroon, MD, under microscope.

Over the last two years, recent advancements in minimally invasive tissue retractors (see photos) and the operating room microscope have allowed us an opportunity to allow professional athletes and now many others to recover more quickly from traditional posterior cervical spine surgery. As team neurosurgeon for the Pittsburgh Steelers, we evaluate players with injuries that may require cervical spine surgery. The typical anterior fusion approach can lead to the loss of play for several months or even end a career if the bone fusion is not adequate. By using the minimally invasive posterior approach which uses an approximately 1 cm incision, we are able to remove the pressure from the exiting nerve root—caused by either a herniated disc or bone spur—and allow the player to return to play much sooner. In a recent series of three professional football players, using the minimally invasive posterior approach, they were able on average to return to play within three weeks of surgery.

Although all recoveries are not the same, similar rapid improvements have been seen in non-athlete patients using this approach. As this approach that has been overlooked for the past two decades it is now time to be reconsidered as a viable alternative for cervical spine decompression. •