

# Current Status and Future of Cervical Spine Surgery in Taiwan

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Cervical spine surgery is very high-risk in the minds of the general public, as it carries such potential complications as hemiplegia, spur recurrence, and worsening of symptoms after surgery. Patients who truly require surgical treatment may hesitate to undergo the procedure and instead seek conservative treatment, thus delaying appropriate treatment beyond the “golden time” for treating the disease. Surgery is indicated in cases of structural instability, nerve compression, kyphosis (hump), functional nerve deficits, and failure of non-surgical methods.

The surgical method depends on the location of the lesion. Most degenerative diseases result from disc problems, and infections and tumors often occur in the front of the spinal cord, so surgery in these cases is performed via an anterior approach. When anterior lesions are extensive or the original spinal curvature is badly distorted, a posterior approach is necessary.

Anterior discectomy and fusion are usually used for anterior decompression. The 3 options for fusion materials are autogenous bone (bone taken from the patient's own iliac or fibula), allogeneic bone from donors, and an artificial prosthesis (cage). Anterior plate fixation is added for fusion of >3 levels or in the presence of concurrent spinal instability.

If the lesions are overly posterior or decompression has been delayed too long, posterior cervical spine surgery, including nerve root foraminotomy, laminectomy, and laminoplasty, is performed for decompression. If the area requiring decompression is too extensive, the latter 2 options are used. Traditional laminectomy will achieve decompression but results in fatigue, kyphosis, and posterior muscle weakness.

Laminoplasty increases the diameter of the spinal canal and achieves decompression but leaves the muscles of the lamina attached, thus avoiding long-term pain, weakness, and even humpback deformation. If instability of the cervical spinal structure is also present, a posterior cervical fixation device is added to the 2 decompression procedures.

This is the current status of cervical spine surgery.

Most traditional spinal fixation and fusion surgeries successfully addressed the instability but sacrificed mobility to do so. In Europe and the United States, artificial disc replacement surgery is performed to preserve the motion of the lesioned segment and potentially prevent adjacent degeneration by simulating the force of normal cervical motion. The early clinical results reported in Europe and the United States are encouraging, but the prosthesis is very expensive and further technological breakthroughs are required.

Cervical percutaneous endoscopic laser treatment of cervical discs has become popular in Taiwan in the last 2 years. Under local anesthesia, the trachea and esophagus are displaced and the targeted cervical disc penetrated with a long needle, which is gradually replaced with a tube. Then, the cartilage clamp and laser are introduced and the backward-projecting cartilage removed. This procedure is appropriate for soft discs but not for patients with spur coverage.

Another potential direction for the development of treatment is cartilage regeneration using genetic engineering or cell culture techniques; for example, an undergraduate is now actively studying a method of co-culturing chondrocytes with bone marrow stem cells to restore their regenerative capacity and then re-implanting the chondrocytes into the intervertebral discs to restore normal disc function. This procedure is still in the animal experiment phase but is the current goal of our department.

The paragraphs above describe the current status of and ongoing developments in cervical spine surgery in Taiwan. The combination of advanced technology with accumulated experience and knowledge can produce rates of satisfaction with surgical results of more than 80% and minimize the incidence of complications.

<http://www1.cgmh.org.tw/intr/intr2/c3270/enortho/index.html>

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