Total disc replacement

Artificial disc replacements, which serve the function of separating vertebrae to allow for proper spinal alignment, can help treat debilitating low back pain in patients who have failed other conservative methods of treatment. Ulf Fernstrom was the pioneer of artificial disc replacement, and his contribution in the way of Fernstrom “Balls” dramatically altered spinal surgery and technique by demonstrating the proper technique and implant that should be utilized for areas requiring motion in many planes. HISTORY OF THE ARTIFICIAL DISC: A Swedish surgeon, Ulf Fernstrom, created his artificial disc inspired by the movement of the hip and knee joints. His implants attempted to restore disc spacing and articulation in patients who had failed conservative measures of treatment. Fernstrom Balls were the first implants of their kind and represent the first attempt at artificial disc replacement. However, many surgeons and researchers questioned Fernstrom Balls, claiming that their lack of elastic properties could potentially damage patients. CONCLUSION: Of the wide range of implants currently on the market for the intervertebral disc space, all designs and applications of products stem from the initial discovery made by Fernstrom thus making him a pioneer in disc replacement [1].

Total disc replacement (TDR) has been used in the lumbar spine since the 1980s, and more recently in the cervical spine.

Although the biomechanical concepts are the same and both are inserted through an anterior approach, lumbar TDR is conventionally indicated for chronic low back pain, whereas cervical TDR is used for soft discal hernia resulting in cervicobrachial neuralgia. The insertion technique must be rigorous, with precise centering in the disc space, taking account of vascular anatomy, which is more complex in the lumbar region, particularly proximally to L5-S1. All of the numerous studies, including prospective randomized comparative trials, have demonstrated non-inferiority to fusion, or even short-term superiority regarding speed of improvement. The main implant-related complication is bridging heterotopic ossification with resulting loss of range of motion and increased rates of adjacent segment degeneration, although with an incidence lower than after arthrodesis. A sufficiently long follow-up, which has not yet been reached, will be necessary to establish definitively an advantage for TDR, particularly in the cervical spine [2].

see Cervical total disc replacement.

see Lumbar total disc replacement

1)
Fisahn C, Burgess B, Iwanaga J, Chapman JR, Oskouian RJ, Tubbs RS. Ulf Fernstrom (1915-1985) and his Contributions to the Development of Artificial Disc Replacements: A Historical Vignette. World Neurosurg. 2016 Nov 5. pii: S1878-8750(16)31136-6. doi: 10.1016/j.wneu.2016.10.135. [Epub ahead of print] Review. PubMed PMID: 27826089.
2)
Vital JM, Boissière L. Total disc replacement. Orthop Traumatol Surg Res. 2014 Jan 8. pii: S1877-0568(13)00280-6. doi: 10.1016/j.otsr.2013.06.018. [Epub ahead of print] PubMed PMID: 24412045.