Cervical disc replacement C5-6

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Introduction

Disc replacement is an alternative to spinal fusion in degenerative disorders. Success of the surgery is dependent on the adequacy of decompression, good positioning and choosing the right size of the prosthesis. The main advantage of replacement over fusion is that it preserves the motion segment of the cervical spine and theoretically protects the adjacent segment from accelerated degeneration.

Case description

The surgery was performed on a 55-year-old male who presented with radiating pain to the right upper limb since 2 months with no relief of symptoms following conservative treatment. On examination Spurling's and Davidson's sign were positive. There was hyposthesia along C6 dermatome and weakness of wrist dorsiflexors. Radiographs showed early spondylotic changes with decreased disc space at C5-6 level. MRI showed C5-6 right paracentral

disc prolapse compressing the right C6 nerve root with adjacent segment degeneration. Cervical disc replacement in such a setting is a preferable alternative to fusion, which was done in this patient.

Surgical procedure

The patient was positioned in supine with neck supported by a roll to maintain the cervical spine in neutral position. Gentle traction was given to the upper limbs and strapped by the side of body. A standard Smith–Robinson anterior approach was used to expose the C5-6 disc space. The longus colli muscles were identified and the disc level was confirmed under image intensifier. C5-6 discectomy was done and the retainer screws for interbody retraction were inserted into the middle of the adjacent vertebral bodies. Under microscopic visualization, the deeper portion of the disc was removed between the medial borders of the uncinat processes. Posterior longitudinal ligament along with anterior, posterior and lateral osteophytes were removed with rongeurs. Excision of the anterior osteophytes allows proper sizing of the implant. It is important to ensure that the subchondral end-plates are not damaged. The disc space was distracted and a trial implant of appropriate size was inserted under image control. The implant should cover most of the intervertebral area. The distance between the implant and the anterior and posterior rim of vertebral bodies should be at least 1–2 mm. The prosthesis was then mounted over the application instrument and inserted into intervertebral space under image control. Oversizing of the implant can be identified by the presence of distracted facet joints posteriorly. Final positioning was confirmed and the distraction released.

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Post-op procedure

Patient is ambulated on the first postoperative day depending on his comfort level.

Discussion and conclusion

Cervical spine arthroplasty scores over fusion by restoring motion with the advantage of preventing adjacent segment degeneration. However, success of the surgery is primarily dependent up on adequacy of decompression. There is no subsidence, device migration or mechanical instability when the device is implanted into properly prepared end-plates. It also enables quicker rehabilitation without the need of an external orthosis.

References

1. Cunningham BW (2004) Basic scientific considerations in total disc arthroplasty. *Spine J* 4:S219–S230
2. Link HD, McAfee PC, Pimenta L (2004) Choosing a cervical disc replacement. *Spine J* 4:294–302
3. Sasso RC, Best NM (2008) Cervical kinematics after fusion and bryan disc arthroplasty. *J Spinal Disord Tech* 21:19–22
4. Eck JC, Humphreys SC, Lim TH et al (2002) Biomechanical study on the effect of cervical spine fusion on adjacent-level intradiscal pressure and segmental motion. *Spine* 27:2431–2434