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Anterior lumbar discectomy and disc replacement

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Discopathy · Disc replacement · Arthroplasty

Introduction

Lumbar total disc replacement was introduced almost 25 years ago. Although from a biomechanical standpoint preservation of motion seems beneficial for the physiological movement of the lumbar spine so far prevention of adjacent segment disease through this procedure has not yet been scientifically proven [1]. Nevertheless it seems desirable to establish a physiological situation after removing a lumbar disc. The presented new Cadisc^{TM}-L not only provides segmental motion but additionally has a cushioning effect and therefore seems to mimic the natural situation more than any previous product.

Case description

The patient is a 36-year-old woman with a history of more than 10 years of back pain, which has become worse over the past 2 years. Conservative management no longer brings any relief. Clinical examination is normal.

X-rays show narrowing of the L4/5 disc and on MRI a black disc with concurrent Modic signs type II are seen without any other abnormalities.

Discography proved very painful and after instillation of bupivacaine into the disc she was pain free for several hours.

Surgical procedure

The patient is placed in Vitruvian position with the legs spread. Access is made to the lumbar spine if necessary by a general surgeon through a left side retroperitoneal approach [2]. After mobilising the rectus muscle laterally, the fascia is incised on the lateral side after which the peritoneal sac is identified and mobilised towards the right side. The next landmark is the psoas muscle and from there the left iliac vein is visualised. Key is clipping and cutting of the lumbar ascending vein, which allows the complete vascular complex to be pushed over to the right exposing the spine at the desired segment.

After exposure the disc is removed, the endplates are cleaned; the posterior annulus and some osteophytes are all carefully removed. The midline of the L4 and L5 vertebra is determined by image intensifier and marked with small pins. Then a distractor is placed exactly over the pins. The distractor also serves as a guidance instrument for measuring and cutting the grooves into the endplates in order to achieve good seating with the rib-bed surface of the implant. This is finally positioned into place.

Postoperative information

Postoperatively the patient is encouraged to move and use the back as normally as possible without too much exertion and avoiding heavy loads for 6 weeks.

Electronic supplementary material The online version of this article (doi:10.1007/s00586-011-1805-7) contains supplementary material, which is available to authorized users.

Discussion and conclusion

In the treatment of single level disc disease leading to disabling back pain, both fusion and arthroplasty have a place. To prove superiority of disc replacement requires a large series of patients, and very long follow-up. So far it has been shown that disc replacement is both safe and effective and from a biomechanical standpoint it appears a more physiological solution than fusion [3–9]. Additionally it is an advantage to use the anterior approach in order to preserve the posterior muscular and bony anatomy. Training in access surgery or assistance by an experienced general surgeon is recommended.

The presented disc replacement has an advantage in that it produces no artefacts in MRI or CT imaging and is mimicking a "normal" disc as no other artificial disc used up to today. The presented disc is placed with a well thought instrumentation in order to have it positioned within the disc space as optimal as possible.

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