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Anterior Cervical Discectomy and Fusion (ACDF): Case Report and Surgical Video

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Epidemiology: Anterior cervical discectomy and fusion (ACDF) is a commonly performed procedure for anterior compressive pathology of the cervical spine, allowing for direct decompression of the spinal cord. Since its implementation it has been associated with significant improvement in neurological symptoms including radiculopathy and myelopathy, and with low morbidity and mortality.

H&P: 69-year-old female with a PMH of hyperlipidemia who presented with 7 months of significant neck pain, gait dysfunction, and left upper extremity (LUE) pain. Patient also endorsed biceps and triceps weakness as well as paresthesias affecting her left thumb. Physical exam confirmed LUE motor weakness and sensory deficits. Patient also had a positive Romberg sign, and hyperreflexia in the patellar tendons, bilaterally.

Imaging: Magnetic resonance imaging (MRI) study with gadolinium demonstrated degenerative disc disease with central and foraminal stenosis worst at C5-6 and C6-7.

Procedure: Patient underwent successful ACDF at the C5-6 and C6-7 levels.

Surgical Outcomes: Postoperative imaging confirmed satisfactory implant placement. On POD #1 patient was discharged home with no complications and proper pain management. At 1-month follow-up patient had no complications and was progressing well. Strength in left arm and balance had improved.

Keywords: ACDF, cervical spine, medical education

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Transcript

SLIDE 1 [TITLE]: 0:00-0:06
This is a case presentation of an anterior cervical discectomy and fusion, or ACDF.

SLIDE 2: 0:06-0:53
An ACDF is a commonly performed procedure for anterior compressive pathology of the cervical spine, allowing for direct decompression of the spinal cord. Since its implementation it has been associated with significant improvement in neurological symptoms including radiculopathy and myelopathy, and with low morbidity and mortality.

This is a case of a 69-year-old female with a past medical history of hyperlipidemia who presented with 7 months of significant neck pain, gait dysfunction, and left upper extremity pain. Patient also endorsed biceps and triceps weakness as well as paresthesias affecting her left thumb. Physical exam confirmed LUE motor weakness and sensory deficits. Patient also had a positive Romberg sign, as well as hyperreflexia in the patellar tendons, bilaterally

SLIDE 3: 0:53-1:02
An MRI study with gadolinium demonstrated degenerative disc disease with central and foraminal stenosis worst at C5-6 and C6-7.

SURGICAL VIDEO: 1:02-4:25
1:02 Using x-ray localization, a transverse incision is made through the dermis is made using a 10 blade. The incision is made medial to the sternocleidomastoid muscle and is carried just past midline. After crossing a thin layer of fat and obtaining hemostasis, the platysma is encountered.

1:20 Platysma is identified, and it is transected. The surgeon may dissect under the platysma with Metzenbaum scissors and lift the platysma away from underlying layers for safe division with monopolar cautery.

1:52 If vessels are encountered, they may be cauterized and cut using bipolar.

2:10 The platysma is undercut using the Metzenbaum scissors to allow for maximal superior and inferior exposure of the cervical spine. At this time blunt dissection is utilized to identify the avascular plane medial to the carotid sheath and lateral to the trachea on palpation. The prevertebral fascia is divided to expose the ALL and longus colli.

2:36 At this time a localization film is taken to confirm correct level of exposure.

2:42 Bipolar or monopolar cautery is used to elevate the longus colli laterally. Care is taken not to expose the sympathetic chain housed within the longus colli to heat or mechanical injury.

3:03 According to surgeon preference Caspar pins may or may not be used for disc space distraction and a 15 blade is used to being annulotomy. Using a combination of burr, curettes, and Kerrison rongeurs, the disc space is prepped from uncovertebral joint to uncovertebral joint. Anterior osteophytes and posterior disc is removed until PLL is encountered.

3:30 Note the vertically oriented fibers. Using a combination of nerve hook, curettes, and Kerrison the PLL is taken down out laterally to the foramen to ensure adequate decompression.

3:54 After ensuring the endplate is drilled flat and osteophytes are taken down, an intervertebral graft is sized and malleted into place.

4:06 After completing all levels of discectomy, screws and plates are placed for spinal stabilization.

4:15 The wound is irrigated, meticulous hemostasis is achieved, and the platysma is closed with vicryl sutures. Skin may be closed with a subcuticular running monocryl stitch.

SLIDE 4: 4:25-4:48
Postoperative imaging confirmed adequate placement of hardware for stabilization. On POD #1 the patient had a drain removed and was discharged home with no complications with proper pain management. At 1-month follow-up patient had no complications and was progressing well. Strength in left arm and balance had improved.

SLIDE 5 [REFERENCES]: 4:48-4:55

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Disclosures

The authors report no conflict of interest concerning the materials or methods used in this study or the findings specified in this paper.

Author Contributions

Conception: all authors. Surgical footage: KH, JJ. Narration: KH. Video and audio design: LPH. Drafting and revising the article: all authors. Approved the final version of the manuscript on behalf of all authors: KH.

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