

Safety and feasibility of outpatient ACDF in an ambulatory setting: A retrospective chart review

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Abstract

Background: Outpatient spinal surgery is becoming increasingly common and in some areas is now the preferred course for certain procedures. Many different procedures, including ACDF, have been examined in the outpatient setting in the past few years but to our knowledge none have included the ambulatory setting.

Methods: All ACDF procedures performed during the time frame of the study were included. Charts were pulled and evaluated using the outcome measures. One and two-level ACDF were divided into respective cervical levels and individually analyzed.

Results: Single level ACDF comprised 62% (n = 74) of the total surgeries. Single level ACDF patients averaged a total hospital stay time of 4.7 hours, with a maximum total stay time of 8.2 hours and a minimum stay time of 0.8 hours. Two-level ACDF made up 38% (n = 45) of the total surgeries. The average total stay time for two level ACDF was 5.4 hours, with a maximum time of 9.6 hours and a minimum of 3.4 hours. All patients were comparable in age and gender. There were no major operating complications and neither re-admissions nor deaths after discharge. There were two transfers from ambulatory surgical centers to inpatient status for observation only.

Conclusions: Outpatient one and two-level ACDF with plate fixation can safely be done on an outpatient ambulatory basis. The data suggest that all subaxial cervical levels can be treated. Patient fusion and satisfaction data were not obtained and thus cannot be commented upon.

Clinical relevance: Ambulatory ACDF should be considered as a feasible option for reducing hospital stay as well as the associated healthcare costs.

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Keywords: ACDF; Ambulatory; Feasibility

Introduction

Anterior cervical discectomy and fusion (ACDF) has long been used to treat a variety of disorders in the cervical spine. Over the past several years, spinal surgery has been increasingly done on an outpatient basis, and ACDF is no exception. With the constant rise in medical costs and the mounting number of procedures, specialized outpatient surgeries are becoming a progressively larger part of surgical practices.^{1,2} Owing to the advancement in outpatient surgical centers, anesthesia, and surgical techniques, outpatient spine surgeries are becoming a preferred method of treatment for both physicians and patients in many locations. The resulting shorter total time in facility and quicker return to home has been demonstrated by Villavicencio et al.³ Reported hospitalization times for the ACDF procedure range from 20

to 96 hours when not done on an outpatient basis.³ Ambulatory care seeks to drastically reduce postoperative hospitalizations and increase patient satisfaction. Studies have proven that other spinal surgeries are safe and cost-effective when done in an outpatient setting^{4,5}; specifically, outpatient lumbar discectomy and cervical laminoforaminotomy have produced good results.⁶ As ACDF is a common surgical procedure for degenerative disc disease and herniated discs, its feasibility as an ambulatory procedure should be examined. Our study seeks to expand on this current literature by dealing with the largest volume of outpatient patients with ACDF, adding the ambulatory setting, and evaluating safety based on the surgical level addressed.

Methods

A retrospective chart review of all patients who underwent single- or two-level ACDF between June 2004 and January 2008 in a physician-owned ambulatory surgery

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center was performed. Data extracted from the charts included the age, gender, date of surgery, indication, surgery level, graft and plate, surgical times, anesthesia time, ambulatory stay time, and complications. The charts also included the clinic notes and these were examined for any evidence of postoperative readmission and complications. All surgeries were done between the C4-C5 and C7-T1 disc spaces. All patients underwent anterior ACDF via the Smith-Robinson approach. Implant choice was based on surgeon preference and included PEEK, allograft with or without local autograft. All patients received anterior plating with system based on surgeon preference. All surgeries were done in the ambulatory surgery center at a privately held orthopedic clinic in Savannah, Georgia. All surgeons were orthopedic fellows trained in spinal surgery.

Clinical progress notes were followed up for up to 1 year and a minimum of 3 months postoperatively to assess postoperative complications requiring readmission. Anesthesia times, surgical times, and total hospital times were averaged both for single- and two-level ACDF as a group, and at each level individually to see if ACDF could safely and efficiently be accomplished in an ambulatory setting.

We performed 119 procedures (66 in males and 53 in females) on patients with ages ranging from 21 to 64 years with an average age of 45 years. The single-level procedures performed involved the C4-C5 disk space in 6 patients, C5-C6 in 39, C5-C6 in 26, and C7-T1 in 3 (total 74 patients). The 2-level procedures involved C4-C5 and C5-C6 in 16 patients and C5-C6 and C6-C7 in 29 (total 45 patients).

Surgical procedure

All patients met with an anesthesiologist for preoperative examination and treatment, and were deemed safe for ambulatory general anesthesia. During the surgical procedure, the patient was placed in the supine position, shoulders taped and no traction applied. Intraoperative fluoroscopy was employed for incision localization, level confirmation and to ensure good hardware position. The approach side varied by surgeon preference and exposure was via the Smith-Robinson approach. Hemostasis was ensured at closure and no drains were applied. The patients were then transferred to the postoperative anesthesia recovery unit for observation and discharge.

Results

A total of 119 patients underwent anterior cervical discectomy and fusion. Most of the patients were male (55.4%) with a mean age of 44.6 years (range: 21–64 years). Females comprised 44.6% of the patients with a mean age of 46.6 years (range: 28–61 years). We performed 60% of the procedures to treat cervical disc herniations, 18% for radiculopathy secondary to spondylosis, and 22% for a spondylolisthesis or combination of spondylolisthesis and spondylosis.

Single-level ACDF comprised 62% (n = 74) of the total surgeries. For single-level ACDF, the mean anesthesia time

Table 1
Mean and ranges for anesthesia, surgical, and hospital stay times for both single- and two-level ACDF

Level	Mean anesthesia time (hours)	Minimum anesthesia time (hours)	Maximum anesthesia time (hours)	Mean surgical time (hours)	Minimum surgical time (hours)	Maximum surgical time (hours)	Mean stay time (hours)	Minimum stay time (hours)	Maximum stay time (hours)	Total number
Single level	2	1.3	3.0	1.3	0.8	2.5	4.7	2.7	8.2	74
Two level	2.3	1.7	3.5	1.6	1.2	2.5	5.4	3.4	9.6	45

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