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Original article

Outpatient anterior cervical discectomy: A French study and literature review

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ABSTRACT

Introduction: In France, surgery for lumbar disc herniation is now being done in the outpatient ambulatory setting at select facilities. However, surgery for the cervical spine in this setting is controversial because of the dangers of neck hematoma. We wanted to share our experience with performing ambulatory anterior cervical discectomy in 30 patients at our facility.

Results: Since 2014, 30 patients (16 men, 14 women; mean age of 47.2 years) with cervical radiculopathy due to single-level cervical disc disease (19 at C5-C6 and 11 at C6-C7) were operated at our ambulatory surgery center. After anterior cervical discectomy, cervical disc replacement was performed in 13 patients and fusion in 17 patients. The mean operative time was 38 minutes and the mean duration of postoperative monitoring was 7 hours 30 minutes. The patients stayed at the healthcare facility for an average of 10 hours 10 minutes. One female patient (3%) was transferred to a standard hospital unit due to a neurological deficit requiring surgical revision with no cause identified. Two patients (7%) were rehospitalized on Day 1 due to dysphagia that resolved spontaneously. Thus the "ambulatory success rate" was 90% (27/30). There were no other complications and the overall satisfaction rate was excellent (9.6/10).

Discussion: Outpatient anterior cervical discectomy is now widely performed in the United States. Ours is the first study of French patients undergoing this procedure. The complication rate was very low (< 2%) and even lower than patients treated in an inpatient hospital setting in comparative studies. Note that our patients were carefully selected for outpatient surgery as certain risk factors for complications have previously been identified (age, 3 + levels, comorbidities/ASA > 2). No deaths in the first 30 days postoperative have been reported in the literature. Wound hematoma leading to airway compromise is rare in the ambulatory setting (0.2%). The few cases that occurred were detected early and the hematoma drained before the patient was discharged. Dysphagia is actually the most common complication (8 to 30%).

Conclusion: Cervical spine surgery can be performed in an ambulatory surgery center in carefully selected patients. Our criteria are patients less than 65 years of age, single-level disease, ASA < 2, and standard cervical morphology. The complication and readmission rates are low. Careful hemostasis combined with close postoperative monitoring for at least 6 hours helps to reduce the risk of neck hematoma. Prevention of postoperative dysphagia must be a focus of the care provided.

1. Introduction

Since it was first described in 1958 by Smith and Robinson [1], anterior cervical fusion is now common spine surgery and has excellent outcomes. The number of cervical spine procedures performed has doubled every year between 1990 and 2000 [2].

In the age of healthcare cost reduction, one of the means to reduce expenses is to shorten the length of hospital stays and decrease perioperative morbidity. One cost-reduction strategy is to perform outpatient procedures in an ambulatory surgery center. There are clear advantages in terms of healthcare costs without reducing the quality of care. In 2010, Wohns showed that performing cervical disc replacement or cervical fusion in an ambulatory setting resulted in 62 and 84% cost savings, respectively, versus a standard inpatient procedure [3]. Ambulatory lumbar and cervical spine surgery is now being performed widely in the United States. In France, surgery for herniated lumbar discs is now being done in the outpatient ambulatory setting at select facilities.[4] However, surgery for the cervical spine in this setting is controversial because of the dangers of neck hematoma.

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Table 1
Inclusion criteria for ambulatory anterior cervical spine surgery in our practice.

Inclusion criteria
Cervical radiculopathy that is recalcitrant to non-surgical treatment
Absence of myelopathy
Single-level disc disease
C5 to C7 level
No comorbidities (ASA 1 or 2)
Normal cervical morphology[a]
No prior surgery on cervical spine
Conditions suitable to returning home (other person at home, healthcare facility nearby[b])

[a] Persons with short, wide necks were excluded due to potential difficulties with the approach.
[b] Facility with emergency room within 30-minute drive.

Table 2
Characteristics of the patients who underwent anterior cervical spine surgery in an outpatient ambulatory setting.

	Patient characteristics ($n = 30$)
Age	47.2 (31–65)
Sex	16 M/14 F
ASA	
1	10
2	20
Level	
C5/C6	19
C6/C7	11
Technique	
Cage	17
Artificial disc	13

The primary goal of this study was to determine the outcomes of 30 patients who underwent ambulatory cervical spine surgery, with special focus on complications and hospital readmissions. We hypothesized that ambulatory surgery would be as safe as standard hospital-based surgery.

2. Materials and methods

This was a prospective study of patients who underwent anterior cervical spine surgery at our ambulatory surgery center between May 2014 and March 2017. The patients had to meet all of the inclusion criteria (Table 1) and volunteer after the principles of ambulatory surgery were explained to them. They were given verbal information about potential complications, in particular, neck hematoma and its warning signs. The patients also had access to a website with additional information.

Since this type of surgery is relatively new for our practice, it is offered to only a very small portion of our cases because of stringent selection criteria (about 5 to 10% of surgically treated herniated cervical disc cases). The care protocol included preoperative consultation with an anesthesiologist and a specially assigned registered nurse to optimize the patients' return home. The patients arrive at our unit at 7:00 am, which allows the surgical procedure to be performed as the first case of the day.

An anterior approach to the cervical spine was done by cervicotomy and then complete discectomy was performed by opening the posterior longitudinal ligament. The disc space was filled with either an artificial disc or a cage prefilled with bone substitutes (Table 2). Anterior cervical plates were not necessary since self-stabilizing cages were implanted. No harvesting of autologous bone graft was needed. All the procedures were performed by two experienced surgeons without magnification.

The patients were monitored for at least 6 hours in the post-anesthesia care unit (PACU). They were discharged after meeting with the anesthesiologist and surgeon if all criteria had been met: normal wound appearance, no increase in cervical circumference (measurement done immediately postoperative and before discharge), reasonable pain levels, no neurological deficit, and able to swallow (assessed with glass of water). A physical therapist met with the patients before discharge to describe the movements they could make and should avoid. A neck collar was not required.

Table 3
Outcomes of 30 cases of anterior cervical spine surgery in an outpatient ambulatory setting in France.

Operative time	38 (23–57)
Duration of postop monitoring (hours)	7:28 (6:45 to 9:27)
Length of stay (hours)	10:11 (9:30 to 12:00)
Transfer to hospital care	1 (3%)
Readmission within 45 days	2 (7%)
Ambulatory success rate	27/30 (90%)
Overall satisfaction	9.6/10

The patients were contacted on postoperative Day 1 by the nurse to determine the following using standardized questionnaires:

- pain measured on a visual analog scale (VAS);
- condition of incision;
- problems swallowing;
- intake of level 1 or 2 analgesics;
- presence of nausea or vomiting;
- overall satisfaction with care provided (subjective score from 0 to 10).

The patients were reviewed in person at 4 weeks postoperative by the surgeon for clinical and radiological assessments.

3. Results

Between May 2014 and March 2017, 30 patients (16 men, 14 women) were included who had an average age of 47.2 years. The patients' characteristics are listed in Table 2.

The average operative time was 38 minutes (23–57). There were no intraoperative complications. While careful hemostasis was performed in all cases, a drain was needed in two patients (7%). This drain was removed before discharge and had few consequences. On average, the patients were monitored for 7 hours 30 minutes (6:45 to 9:30) in the PACU and were in the ambulatory surgery center for a total of 10:10 hours (9:30 to 12:00).

Twenty-nine of the 30 patients were able to return home the same day. One female patient (3%) was transferred to a hospital facility. She had undergone C6-C7 disc replacement without complications. Because of the presence of immediate postoperative hemiplegia, an urgent neck and head MRI was done; there were no abnormal findings expect for artifacts in the operated area. She underwent surgical revision; no hematoma or hardware migration was noted. The artificial disc was removed, and arthrodesis performed. She recovered normal neurological function in 4 days. Follow-up MRI at 15 days showed no abnormal medullary findings. After ruling out organic causes, a psychological assessment led to the diagnosis of conversion paralysis. This clinical case was featured in a scientific publication [5].

Two patients (7%) were rehospitalized at Day 0 and Day 1 because of disabling dysphagia. This condition resolved after steroid injection and the patients were able to return home after being kept at the hospital overnight for observation.

We defined "ambulatory success" at the percentage of patients who did not need to be moved to a standard hospital bed or need to be readmitted within the first 30 days postoperative. This rate was 90% in our cohort (27/30). There were no other complications in the first 45 days postoperative, specifically no infection, epidural or retropharyngeal hematoma. The overall satisfaction rate was 9.6/10. The results are summarized in Table 3.

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