Outpatient surgical treatment of cervical radiculopathy

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Because of improvements in anesthesia and surgical techniques, a number of surgical procedures previously thought to require hospitalization are now routinely offered on an outpatient or overnight basis. Cost containment with limited hospital stays is an increasingly significant factor in today’s health care system. The treatment of cervical and lumbar radiculopathy caused by disc herniation or degenerative osteophyte formation has been the subject of neurosurgical attention for many years. Outpatient lumbar surgery has been reported and used safely in selected patients. Percutaneous lumbar discectomy techniques have been performed and are considered advantageous by some surgeons because of the short hospital stays that are involved. The successful treatment of cervical radiculopathy by posterior laminoforaminotomy has been published extensively in the literature. In this paper, we describe a group of patients who underwent conventional limited posterior procedures for cervical nerve root compression in the outpatient setting.

Clinical Material and Methods

Patient Population and Treatment

Between January 1993 and May 1996, 502 patients underwent posterior surgical treatment for cervical radiculopathy. During this period, 200 patients (39.8%) opted for outpatient surgery. Of these 200 patients, 183 individuals could be reached for follow-up review. Because two of the patients required a second posterior operation, our study focuses on a total of 185 procedures in 183 patients treated on an outpatient basis. There were 114 men and 69 women in this group, with a median age of 46.1 years (range 27–68 years). Table 1 provides a summary of the particular levels involved in the surgeries. Follow-up review of the patients ranged from 3 to 43 months, with a mean of 19 months. In cases in which Workers’ Compensation claims were not involved, 92.8% of patients reported an excellent or good outcome and returned to work or comparable duties at a mean of 2.9 weeks. In cases in which Workers’ Compensation claims were involved, 77.8% of patients reported excellent or good outcome and returned to work at a mean of 7.6 weeks postoperatively. Two patients whose cases involved Workers’ Compensation claims did not return to work. There were seven patients (3.8%) who had a poor outcome. Two of these patients underwent a second posterior procedure and reported a good outcome at the time of follow-up review. The results of this study show that outpatient surgical treatment of cervical radiculopathy can be safely provided in selected patients with outcomes similar to the inpatient surgical management of these individuals.

Key Words • cervical radiculopathy • disc protrusion • microdiscectomy • outpatient surgery
All surgeries were performed in the usual neurosurgical operating rooms using general anesthetic techniques. Postoperatively the patients were transferred to the postanesthesia care unit and observed for any immediate complications. After remaining in this setting for the standard observation time, the patients were transferred to the outpatient surgical area. All patients were observed for at least 4 hours prior to discharge. No bladder catheters were used intraoperatively and the patients were required to void and take liquids orally before discharge. In addition, the patients were required to walk without assistance before leaving the hospital.

Standard hospital criteria for outpatient surgery were observed, including the presence of a responsible adult to drive the patient home (or to the hotel) and remain with the patient the 1st night. The patients were given preoperative instruction that included criteria that merited concern and instructions for contacting the surgeon. No patient returned to the hospital, including the emergency department, after discharge. Discharge courses of medications varied depending on the surgeon: one prescribed a methylprednisolone pack to be taken as directed; one, 0.75 mg dexamethasone twice daily for 4 days; and another, 20 mg prednisolone pack to be taken as directed; one, 0.75 mg mastat; Jandel Scientific Software, San Rafael, CA) and using a commercially available software program (Sigmastat; Jandel Scientific Software, San Rafael, CA) and statistical significance was assumed at the 5% level.

**Operative Technique**

The three surgeons (J.B.B., W.D.P., and R.L.H.) selected different surgical strategies; however, all procedures were performed using small incisions estimated to range between 1.2 cm and 3 cm, depending on patient size and the levels surgically treated. An intraoperative lateral cervical x-ray study was used to confirm the correct level. Two surgeons performed the operation with the patient in the sitting position, constrained by nonpenetrating head-holding devices. One of these surgeons used a drill for the foraminotomy and the other used a small punch. The third surgeon performed the procedure with the patient prone, restrained by a penetrating head holder; this surgeon used a drill for the foraminotomy. All patients received antibiotic agents prior to the skin incision and 2 to 4 mg of dexamethasone; some patients were given 4 mg of ondansetron hydrochloride (Zofran) intraoperatively.

Two surgeons used posterior Caspar retractors and one used a modified Williams retractor. One surgeon used an operating microscope, one used 4.5 loupe magnification, and one used no magnification. Key-hole laminoforaminotomies were performed with approximately 5 mm of bone removed from the inferior and superior edges of adjacent lamina and medial facet. Bone nerve root decompression and removal of ruptured disc fragments were accomplished; however, removal of intervertebral disc material that extended beyond the ruptured fragment was not attempted. Careful attention was paid to meticulous hemostasis and minimal manipulation of the nerve root. The cervical surgery performed in each case was the same procedure that each surgeon performs on patients electing to have inpatient surgery.

**Statistical Analysis**

The Mann–Whitney rank sum test was used to compare outcomes between male versus female patients and between cases that involved Workers’ Compensation claims versus those that did not. Computations were made using a commercially available software program (Sigmastat; Jandel Scientific Software, San Rafael, CA) and statistical significance was assumed at the 5% level.

**Results**

Patient outcome was determined by reviewing complications, the incidence of recurrent radiculopathy, functional outcome, and the time between surgery and return to full-duty work or equivalent activity. There were no infections or other significant medical complications after outpatient surgery. No patient required hospital readmission or an office visit prior to the scheduled follow-up appointment. Reviewed retrospectively, only three of the 183 patients expressed a complaint related to early discharge. Each of these three noted mild nausea after returning home. Table 2 lists the criteria for assessing functional outcome. The mean follow-up review was 19 months (range 3–43 months); patients were contacted by telephone following their initial office visits.

In the 167 cases that did not involve Workers’ Compensation claims, 154 patients (92.8%) reported an excellent or good outcome, seven (4.2%) a satisfactory outcome, and five patients (3%) a poor outcome. One patient with a poor outcome underwent a second posterior procedure and received a good grade at 1-year follow-up.
Outpatient cervical spine surgery

TABLE 3

Functional outcome and recuperation time in 183 patients who underwent outpatient surgery for cervical radiculopathy

<table>
<thead>
<tr>
<th>Outcome</th>
<th>No Workers' Compensation</th>
<th>Workers' Compensation</th>
<th>Total Cases</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Men (102)</td>
<td>Women (65)</td>
<td>Men (13)</td>
</tr>
<tr>
<td>excellent</td>
<td>76</td>
<td>51</td>
<td>6</td>
</tr>
<tr>
<td>good</td>
<td>18</td>
<td>9</td>
<td>4</td>
</tr>
<tr>
<td>satisfactory</td>
<td>4</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>moderate</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>poor</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>return-to-work interval (wks)†</td>
<td>2.9</td>
<td>3.1</td>
<td>7.5</td>
</tr>
</tbody>
</table>

* Two patients underwent repeated surgery.
† Two patients whose cases involved Workers’ Compensation claims did not return to work.

up review. One other patient with a poor outcome opted for an anterior cervical procedure. Individuals for whom Workers’ Compensation did not apply returned to work at a mean of 2.9 weeks (range 2 days–12 weeks).

In the 18 cases involving Workers’ Compensation claims, 14 patients (77.8%) reported an excellent or good outcome, two (11.1%) a satisfactory outcome, and two (11.1%) a poor outcome. One patient with a poor outcome underwent a second posterior procedure and noted a good result at 4-month follow-up review. Patients in this group returned to work at a mean of 7.6 weeks (range 2–12 weeks). One patient in whom a satisfactory result was obtained and one with a poor outcome did not return to work.

Overall, at the time of follow-up review, five of the seven patients with poor outcomes had disability claims or litigation pending. Tables 2 and 3 provide summaries of outcomes and return-to-work intervals. There was no difference in outcome with regard to gender. As expected, there was a statistically significant difference in outcome between cases that involved Workers’ Compensation claims and those that did not (p = 0.0084).

Discussion

Improved anesthesia and operative techniques, as well as cost containment and societal acceptance, have changed the approach to surgical care in many specialties. General anesthetic agents in the outpatient setting are widely accepted as safe and are considered a standard choice in today’s surgical practice. In the last decade, smaller surgical incisions and precision dissections have led to decreased postoperative pain, earlier mobilization, and a decrease in hospital stay. Neurosurgical management of radiculopathy is an ideal outpatient procedure because of the brevity of the surgery, the ability to perform limited incisions and dissections, and a low immediate complication rate.

As surgeons, we vary in our choice of surgical technique. Regardless of the method preferred, the key in the outpatient setting is limited dissection and meticulous hemostasis. Exact localization of the incision and precise adherence to appropriate anatomical dissection planes are paramount considerations. This results in limited musculoskeletal pain, thus allowing outpatient management. The surgeon must remain flexible and vigilant when working in the outpatient setting. In our cases, all patients were required to walk unassisted, take liquids orally, and void before they were discharged. The patients had to be free of nausea and vomiting and a responsible adult was required to stay with them the 1st night. Patient satisfaction was high and many patients were happy to avoid hospitalization. We are currently experiencing a higher percentage of patients choosing outpatient surgery and we find that many patients who have traveled long distances prefer to stay at their hotel than at the hospital following the procedure.

Carefully addressing patients’ concerns about postoperative pain and assuring them of the surgeon’s availability increases their confidence in accepting outpatient surgery. Immediate resolution of radicular pain further bolsters the patient’s confidence in returning home the day of surgery. However, caution must be exercised when discussing outpatient spine surgery because many patients are not candidates. We do not advocate abandoning inpatient care for the treatment of cervical radiculopathy; however, we do believe that a substantial subgroup of the total population can be safely managed as outpatients. The points that we believe are important include the absence of complications in the immediate postoperative period and long-term results comparable to the inpatient surgical management of cervical radiculopathy.

References


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