Objective : To analyze the clinical outcomes of computed tomography (CT) fluoroscopy-guided selective nerve root block (SNRB) for severe arm pain caused by acute cervical disc herniation.

Methods : The authors analyzed the data obtained from 25 consecutive patients who underwent CT fluoroscopy-guided SNRB for severe arm pain, i.e., a visual analogue scale (VAS) score of 8 points or more, caused by acute soft cervical disc herniation. Patients with chronic arm pain, motor weakness, and/or hard disc herniation were excluded.

Results : The series comprised 19 men and 6 women whose mean age was 48.1 years (range 35-72 years). The mean symptom duration was 17.5 days (range 4-56 days) and the treated level was at C5-6 in 13 patients, C6-7 in 9, and both C5-6 and C6-7 in 3. Twenty-three patients underwent SNRB in 1 session and 2 underwent the procedure in 2 sessions. No complications related to the procedures occurred. At a mean follow-up duration of 11.5 months (range 6-22 months), the mean VAS score and NDI significantly improved from 9 and 58.2 to 3.4 and 28.1, respectively. Eighteen out of 25 patients (72%) showed successful clinical results. Seven patients (28%) did not improve after the procedure, and 5 of these 7 underwent subsequent anterior cervical discectomy and fusion.

Conclusion : CT fluoroscopy-guided SNRB may play a role as a primary conservative treatment for severe arm pain caused by acute cervical disc herniation.

KEY WORDS : Cervical vertebrae · Intervertebral disc · Nerve block.

INTRODUCTION

Cervical radicular pain, which is usually caused by cervical disc herniation, is a common condition. The natural history of cervical radiculopathy is usually favorable. However, some patients with acute cervical disc herniation may suffer from severe arm pain, which is unresponsive to conservative treatments such as oral analgesics and/or physical therapy. In these situations, patients usually require surgical treatment. Because of the well-known drawbacks of anterior cervical spinal surgery, such as perioperative complications, limitation of range of motion, and/or adjacent segment degeneration, selective nerve root block (SNRB) has played an important role as a conservative treatment for cervical disc herniation. The clinical results of SNRB for cervical disc herniation have been reported to be favorable.

The question that remains is whether SNRB would work in patients with very severe arm pain, i.e., a visual analogue scale (VAS) score of 8 points or more, caused by acute cervical disc herniation. Surgeons usually recommend urgent surgical intervention for these patients, since they do not usually respond well to any conservative treatments. However, reports focusing on the clinical outcomes of SNRB for severe arm pain due to acute cervical disc herniation are limited.

In the present study, we analyzed the clinical outcomes of 25 consecutive patients who underwent computed tomography (CT) fluoroscopy-guided SNRB for severe arm pain caused by acute cervical disc herniation.

MATERIALS AND METHODS

The authors retrospectively analyzed the data obtained from 25 consecutive patients who underwent CT fluoroscopy-guided SNRB for severe arm pain caused by acute cervical
A 51-year-old female had been suffering from severe right arm pain for 1 month. The axial T2-weighted magnetic resonance image (A) shows disc herniation at the C6-7 level on the right side. A bone set image from CT fluoroscopy at the C6-7 level (B) shows a well-placed needle and injected contrast media inside the foramen and posterolateral epidural space. The needle is kept safely away from the carotid artery, internal jugular vein, and vertebral artery. The head is turned to the contralateral side.

DISCUSSION

SNRB is performed as a conservative treatment modality for cervical radiculopathy. The clinical outcomes of thera-
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Table 1. Demographics and clinical results

| No | Sex | Age (days) | Symptom duration | Level | Side | Block number | Initial VAS | Initial NDI | Final VAS | Final NDI | Surgery |
|----|-----|------------|------------------|-------|------|--------------|-------------|------------|----------|----------|---------|---------|
| 1  | M   | 49         | 28               | C67   | L    | 1            | 8           | 56         | 8        | 56       | Y       |
| 2  | M   | 39         | 14               | C67   | L    | 1            | 9           | 55         | 1        | 18.3     | N       |
| 3  | M   | 54         | 42               | C67   | R    | 1            | 9           | 56         | 9        | 56       | Y       |
| 4  | M   | 53         | 5                | C56   | L    | 1            | 9           | 60         | 0        | 16.7     | N       |
| 5  | M   | 40         | 10               | C56   | R    | 1            | 8           | 46.3       | 6        | 40       | N       |
| 6  | M   | 54         | 14               | C56   | L    | 1            | 10          | 30         | 8        | 30       | Y       |
| 7  | M   | 46         | 5                | C56   | R    | 1            | 10          | 63.3       | 2        | 18.3     | N       |
| 8  | F   | 50         | 56               | C56   | L    | 1            | 8           | 35         | 8        | 31.7     | N       |
| 9  | M   | 48         | 5                | C56   | L    | 1            | 9           | 60         | 9        | 60       | Y       |
| 10 | M   | 37         | 56               | C67   | L    | 1            | 8           | 50         | 2        | 18.3     | N       |
| 11 | M   | 35         | 14               | C56   | L    | 2            | 8           | 45         | 2        | 20       | N       |
| 12 | F   | 36         | 7                | C67   | L    | 1            | 9           | 60         | 1        | 16.7     | N       |
| 13 | F   | 51         | 30               | C67   | R    | 2            | 10          | 70         | 1        | 18.3     | N       |
| 14 | M   | 50         | 14               | C56   | L    | 1            | 8           | 55         | 1        | 18.3     | N       |
| 15 | M   | 53         | 7                | C56   | L    | 1            | 10          | 66.7       | 1        | 16.7     | N       |
| 16 | M   | 72         | 14               | C56   | L    | 1            | 9           | 66.7       | 1        | 20.4     | N       |
| 17 | M   | 52         | 7                | C56   | R    | 1            | 9           | 70         | 1        | 18.3     | N       |
| 18 | M   | 57         | 4                | C56   | R    | 1            | 10          | 65         | 2        | 33.3     | N       |
| 19 | F   | 42         | 7                | C56   | R    | 1            | 10          | 78.3       | 1        | 18.3     | N       |
| 20 | M   | 49         | 42               | C67   | L    | 1            | 10          | 64         | 10       | 64       | Y       |
| 21 | F   | 48         | 8                | C56   | R    | 1            | 10          | 78.3       | 1        | 18.3     | N       |
| 22 | M   | 52         | 20               | C56   | L    | 1            | 10          | 78.3       | 1        | 23.3     | N       |
| 23 | M   | 42         | 21               | C56   | L    | 1            | 10          | 68.3       | 5        | 28.3     | N       |
| 24 | M   | 52         | 4                | C67   | R    | 1            | 9           | 66.7       | 3        | 30       | N       |
| 25 | F   | 41         | 4                | C56   | R    | 1            | 10          | 80         | 3        | 18.3     | N       |

F: female, M: male, NDI: Neck Disability Index, ODI: Oswestry Disability Index, Sx: symptom, VAS: visual analogue scale
patients underwent subsequent cervical spinal. However, SNRB can be used as a diagnostic modality. Diagnostic SNRB can discern the presence or absence of cervical pathologies that cause radiculopathy. In cases where the MRI findings are equivocal, multilevel, and/or do not match with the clinical symptoms, SNRB can be useful for decision-making. Positive SNRB results are known to be associated with good surgical outcomes. The complication rate after SNRB using fluoroscopy only for cervical radiculopathy is reported to be low. However, vascular and neural complications may occur during this procedure, which may result in, although rare, spinal cord infarction, quadriplegia, and even death. Therefore, the effort to minimize any chance of complications is of the utmost importance during SNRB. Unlike SNRB using fluoroscopy only, one can identify the major cervical vessels and other important anatomical structures on a CT axial view with superior anatomic resolution using the multislice CT fluoroscopy-guided technique. One can therefore place the needle more safely and precisely for injection without any complications compared with SNRB using fluoroscopy only. Kim et al. reported no serious complications with this technique and our results confirm this finding, as there were no complications either during or after the procedure in the cases we analyzed.

There are several limitations to this study. It was retrospective, and there was no control group with which outcomes may be compared. Furthermore, the sample size was relatively small. The follow-up data collection took place at an average of 11.5 months after treatment, but the follow-up time varied from 6 to 22 months. Despite these limitations, this study demonstrates the efficacy and durability of CT fluoroscopy-guided SNRB for patients with severe radicular pain caused by acute soft cervical disc herniation.

**CONCLUSION**

A considerable number of patients suffering from severe arm pain caused by acute cervical disc herniation could be helped by CT fluoroscopy-guided SNRB. This would also avoid the need for cervical spinal surgery. Thus, CT fluoroscopy-guided SCRB can be considered as a useful conservative treatment option for severe arm pain caused by acute soft cervical disc herniation.

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