



# Clinical Efficacy of Scalene Injection for Thoracic Outlet Syndrome

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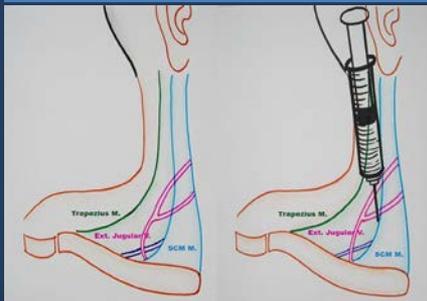
## Introduction

- Thoracic outlet syndrome is a disease in which the brachial plexus, subclavian artery, and subclavian vein are compressed by the upper thoracic structures causing various symptoms.
- Scalene injection is not only a treatment for thoracic outlet syndrome, but also a diagnostic tool.
- The purpose of this study is to investigate the usefulness and safety of the scalene injection in the diagnosis, treatment, and pain management of patients with thoracic outlet syndrome.

## Materials and Methods

- Retrospective review of 266 cases for 17 years
- Mean age 57.7
- 114 Men, 152 Women
- Diagnostic criteria (Table 1)
- Every scalene injection is performed by only one hand surgeon.
- Injection solution is composed of Bupivacaine(0.5%) 7mL + Triamcinolone 1mL
- Schematic injection site (Fig. 1)

Figure 1



## Results

- NRS decreased 7.12 to 3.11(1wk) and 3.05(12wks later).
- NDI decreased 15.87 to 6.15(1wk) and 6.19(12wks later) (Table 2).
- 242 of 266 patients showed prompt decrease of NRS.
- Complication
  - 2 cases of seizure
  - 2 cases of dyspnea
  - 1 case of nausea

## Discussion

- Statistically significant pain decrease and improvement in functional discomfort.
- Side effects occurred in 1.9% of patients, although limited to the day of the injection.
- Beware of the side effect of dyspnea caused by phrenic nerve running in front of the anterior scalene muscle.
- Better to do it in an operating room where vital signs can be observed and immediate oxygenation and sedation can be administered.

## Conclusions

- Scalene muscle injection therapy can be used as an effective treatment method as well as for diagnostic purposes.
- It is recommended to do it in an operating room for patient's safety.

Table 2

Follow-up	NRS	NDI
Preoperative	7.12 ± 1.70	15.87 ± 8.80
Postoperative (wk)		
1	3.11 ± 1.80	6.15 ± 6.60
12	3.05 ± 1.80	6.19 ± 6.20
p-value	<0.05	<0.05

Table 1

### Criteria of thoracic outlet syndrome

1. Clinical finding	headache, sleep disturbance and either sensory dysfunction or muscle weakness in the face, upper limbs, shoulders, upper chest or upper abdomen
2. Physical examination	Either tenderness of the anterior scalene muscle or Tinel's sign of the brachial plexus
3. Provocation test	Positive finding in the following 3 provocation tests; neck tilt test, hyperabduction test, and costoclavicular compression test