

## Case Series

# Twelfth rib syndrome: role of intercostal blocks: case series of 10 patients

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## ABSTRACT

Twelfth rib syndrome (TRS) is a rare condition that causes severe pain in the loin. It is often misdiagnosed, leading to unnecessary investigations and treatments. Intercostal blocks in the 11<sup>th</sup> and 12<sup>th</sup> rib often resolve the pain for these patients. In this research paper, we aim to explore the role of intercostal block in the management of TRS based on our experience with 10 patients. Data of patients who were diagnosed with TRS were studied retrospectively from our hospital records who have been given intercostal block injection from the period of Jan 2022 to August 2023 as an audit. Four patients underwent intercostal blocks. VAS scores were measured in follow-up for 1 and 3 months. 4 patients were lost to follow up and hence not considered in this study. The male to female ratio was 7:3. There was a statistically significant reduction in VAS score at 1 month and 3 months compared to pre-injection times. Patients who have failed conservative management for TRS can be effectively managed with intercostal block injections.

**Keywords:** Slipping rib syndrome, TRS, Loin pain, Intercostal nerve root blocks

## INTRODUCTION

As thoracic surgeons and orthopods, we often encounter patients with chest pain that is not related to cardiac or pulmonary issues. TRS is a similar problem with severe pain in the loin. It is riddled with delayed diagnosis and often considered to be nonspecific back pain, radiating chest pain or abdominal pain. Diagnosis of TRS is often diagnosis of exclusion. Movement, such as reclining, leaning forward, turning the trunk, lifting items, or bending across, typically makes the discomfort worse. It might be persistent or sporadic, dull, achy, or acute. On physical inspection, point tenderness may usually duplicate the discomfort.<sup>1</sup> Intercostal blocks have shown promising results to treat this condition.<sup>2</sup> In this research paper, we aim to explore the role of intercostal block in the

management of TRS based on our experience with 10 patients.

## CASE SERIES

We retrospectively studied patients who were diagnosed with TRS and who failed conservative management and were given intercostal block injections. The data of these patients in a period of January 2022 to August 2023 was studied as an audit on a retrospective basis. As the data was studied retrospectively as an audit, no ethics committee approval was needed.

Technique of intercostal injection-After gaining patients written and voluntary consent, the patients were given injection on an outpatient basis. Under all aseptic

precautions, a cocktail of 2 ml of 2% lignocaine and 2 ml of 0.5% bupivacaine with 20 mg triamcinolone maleate was injected each in the intercostal groove of 11<sup>th</sup> and 12<sup>th</sup> rib about 7-8 centimetres from the posterior midline.

The results showed that 14 patients with TRS had intercostal blocks throughout the time. Four patients were removed from the trial because they did not continue to follow up till three months. Seven of the 10 cases were

male, and three were female. Six patients felt flank discomfort on the right side; the others had it on the left. In our investigation, there were no instances of bilateral side pain. According to Table 1, there was a substantial drop in VAS scores from an average pre-injection score of 7.1 to a post-injection score of 1.7 (paired T test,  $p < 0.005$ ). There were no side effects seen, however one patient who had a pre-injection VAS score of 6 and a post-injection VAS score of 4 continued to have discomfort (Table 1).

**Table 1: Sex, age distribution with VAS score at 3 stages-pre-injection, post-injection 1 month and post-injection 3 months.**

Patients number	Sex	Age (In years)	VAS score pre injection	VAS score 1 month	VAS score 3 month
1	M	45	7	2	2
2	M	34	8	1	0
3	M	32	7	0	0
4	M	37	6	2	1
5	F	47	9	3	1
6	M	54	8	2	1
7	F	46	7	1	0
8	M	56	6	4	4
9	F	32	7	2	1
10	M	71	9	0	0
	Mean	45.4	7.4	1.7	1

## DISCUSSION

Our study has shown that intercostal blocks in symptomatic TRS patients had significant pain relief, when they have failed by conservative methods. With a mean VAS score change from 7.4 before injection to 1.7 in 1 week and 1 score after 3 weeks.

TRS characterises prolonged periods of dull or sharp aching pain in the flank regions which is exacerbated by physical activities. Diagnosis is often arrived after exclusion of all other possible other causes and confirmed by a "hooking manoeuvre" described by Heinz et al.<sup>3</sup> This leads to delayed diagnosis and management of TRS.<sup>4</sup> Conservative management is generally the first line of treatment with analgesics, heat packs and rest.<sup>4</sup> Nerve blocks are effective in short terms but their long term evidence is lacking. Non-responsive patients with severe pain may be treated with 12<sup>th</sup> rib resection, however evidence is not conclusive.<sup>1</sup> The intercostal nerve plays an important role in the etiopathogenesis of TRS. The pathology arises basically due to irritation of the intercostal nerve due to hypermobility of the twelfth rib. Intercostal nerve root blocks have both a diagnostic and therapeutic role in TRS.<sup>2</sup>

Jung et al has published a case report showing a 72 year and 47 year old female patient having immediate and significant pain relief with intercostal nerve root blocks. However, these patients were lost in follow-up.<sup>2</sup> Kumar et al have shown 3 cases. They were treated with intercostal nerve blocks in 2 cases having complete pain relief with single injection. One case showed reduced pain after the

first nerve root block, but relapsed with pain, which was treated after 2<sup>nd</sup> nerve root injection completely.<sup>5</sup>

Intercostal nerve root block's quick pain alleviation is frequently enough to convince the patient that their discomfort is "musculo-skeletal" in nature. More invasive procedures might be thought about in case the pain relief is only temporary with nerve root blocks. These include percutaneous dorsal root ganglion radiofrequency thermocoagulation with image intensifier, recurrent intercostal nerve blocks, intercostal nerve cryotherapy, costo-vertebral injections, and infrequently rib excision.<sup>6</sup>

Our experience with 10 patients suggests that intercostal block can provide immediate pain relief and may have a diagnostic value in confirming the diagnosis of TRS.

Our study is the first study with 10 cases of twelfth rib syndrome showing good pain relief with intercostal nerve root blocks. Our study has few limitations. The data is retrospectively collected as an audit causing selection bias. The study shows a short term follow up of 3 months' time only.

Further studies are needed to determine the optimal dosage and frequency of intercostal block, as well as its long-term efficacy and safety.

## CONCLUSION

TRS is a diagnosis of exclusion riddled with delayed management. If conservative modalities fail, intercostal

nerve root blocks can give good and immediate short term pain relief.

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