



## Case Report

# Resection arthroplasty for isolated costotransverse joint osteoarthritis: A case report and literature review

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## ABSTRACT

**Background:** Symptomatic isolated costovertebral joint (CVJ) osteoarthritis is rare, and establishing this diagnosis is often difficult. There are few reports in the literature about how to surgically manage these lesions. Our aim was to describe a case of isolated osteoarthritis of the costotransverse joint (CTJ) successfully treated with a resection arthroplasty.

**Case Description:** A 51-year-old female presented with 3 years of the right paravertebral T 10-level back and radiating pain. No conservative treatment modality effectively resolved this pain (i.e., these included anti-inflammatory medications, physiotherapy, and joint blockages). MRI, CT, and technetium-99m methylene diphosphonate bone scintigraphy demonstrated inflammatory changes involving the right T10 CTJ. Following resection arthroplasty, the patient's symptoms abated.

**Conclusion:** Symptomatic osteoarthritis of the right T10 CVJ successfully resolved following costotransversectomy for joint resection arthroplasty.

**Keywords:** Costocorporeal joint, Costotransverse joint, Costotransversectomy, Costovertebral joint, Isolated osteoarthritis, Resection arthroplasty

## INTRODUCTION

The costocorporeal joint (CCJ) and costotransverse joint (CTJ) are both typically grouped as costovertebral joints (CVJs).<sup>[4]</sup> These joints contain hyaline cartilage that can become inflamed, resulting in pain attributed to arthritis.<sup>[1,3]</sup> The pain is typically deep and may be exacerbated by trunk movement, coughing, deep breathing, and yawning.<sup>[3,7]</sup> Further, it may compromise the intercostal nerve roots.<sup>[6]</sup> However, the CTJ is unique in that it includes the articulation of the tubercle of the rib with the transverse process of the corresponding thoracic vertebra, and isolated osteoarthritis (IOA) of the CVJs is rare.<sup>[7]</sup>

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Although many patients may favorably respond to conservative treatment modalities, some refractory cases will require resection arthroplasty.<sup>[7]</sup> Herein, we report a 51-year-old female with IOA of the right T10 CTJ successfully treated with resection arthroplasty.

## CLINICAL PRESENTATION

A 51-year-old female presented with the right thoracic back pain at the T10 level of 3 years duration. Her neurological examination was normal. Prior unsuccessful treatment modalities had included B1, B6, and B12 replacement therapy, analgesics, nonsteroidal anti-inflammatory drugs, opioids, gabapentin, physiotherapy, acupuncture, and global posture reeducation. All laboratory tests for rheumatoid disease (antinuclear antibodies, rheumatoid factor and anticyclic citrullinated peptide antibodies, erythrocyte sedimentation rate, and C-reactive protein) were negative.

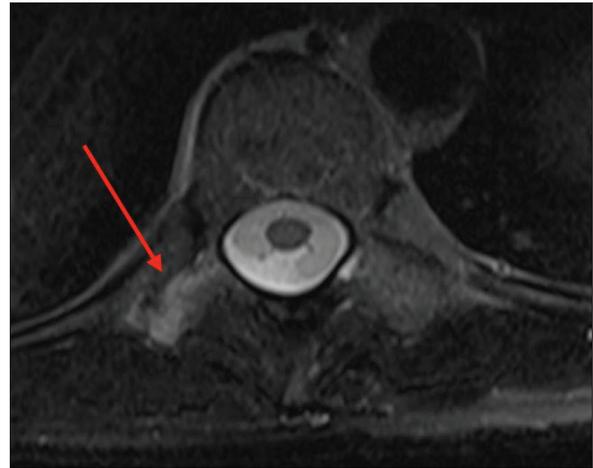
### Magnetic resonance imaging (MRI) and computed tomography (CT) studies of the right T10 CTJ

The thoracic CT revealed subchondral sclerosis involving the right T10 transverse process, while the MRI demonstrated hyperintensity of the right T10 CTJ (i.e., on T2 weighted and STIR extending to adjacent muscle adipose planes and T10 nerve foramen [Figures 1 and 2]). The bone scan (i.e., Technetium-99m methylene diphosphonate bone scintigraphy) additionally showed a focal radioisotope hyper-uptake in the right T10 CTJ [Figure 3]. In sum, all examinations demonstrated IOA involving the right T10 CTJ. Two fluoroscopically guided right T10 CTJ blocks with lidocaine/methylprednisolone acetate did not provide long-term success.

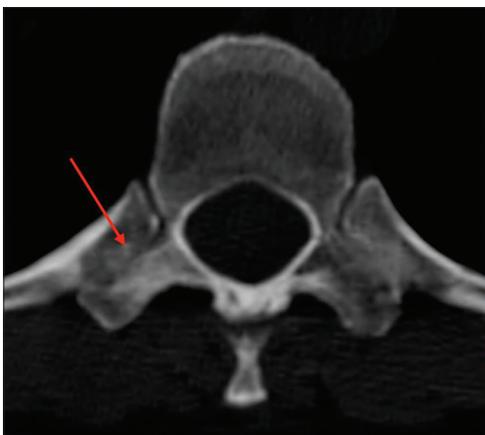
### Surgery and outcome

The patient underwent a right T10 CTJ resection arthroplasty.<sup>[7]</sup> The postoperative MRI confirmed the

resection of the right T10 CVJ (CTJ and CCJ) and complete resolution of the inflammatory findings [Figure 4]. The pathology report revealed loss and destruction of articular cartilage within the right T10 CVJ attributed to an inflammatory process with thickening of the subchondral bone and bone marrow fibrosis; no bacteria were identified in either the bone or joints cultures. In short, the diagnosis



**Figure 2:** Thoracic spine MRI exhibited hyperintensity on T2 and STIR of the right T10 costotransverse joint extending to adjacent muscle adipose planes and T10 nerve foramen.



**Figure 1:** Axial thoracic spine computed tomography showing subchondral sclerosis in the right T10 transverse process.

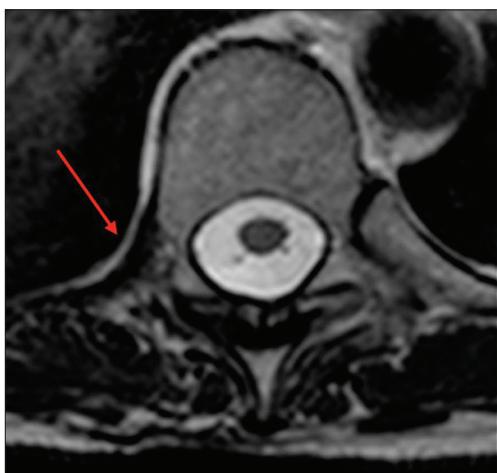


**Figure 3:** Bone scintigraphy posterior view showing focal radioisotope hyper-uptake area in the right T10 level.

of IOA of the CTJ was confirmed. Within 1 month postoperatively, the patient's pain improved and she has remained pain free for the past 3.5 years.

## DISCUSSION

CVJ osteoarthritis is common, but often asymptomatic.<sup>[5]</sup> Osteoarthritis usually affects several joints and especially weight-bearing ones. What stands out in this case is that according to the scintigraphy result, only the right T10 costotransverse joint was affected. Due to the rarity of this condition and the difficulty in finding a diagnosis, the patient was submitted to several nonspecific treatment modalities for the management of thoracic back pain. Conservative treatment included multiple analgesics drug combinations and CTJ blocks without success. Finally, the right T10 CTJ joint resection and arthroplasty resulted in permanent pain relief. There are only a few cases described in the literature of resection arthroplasty for IOA<sup>[2,7]</sup> [Table 1].



**Figure 4:** Postoperative spine MRI. Axial slice of T2-weighted sequence demonstrating the absence of the right T10 transverse process and rib. Note that the hyperintense lesion due to inflammatory edema has disappeared (compare with Figure 2).

**Table 1:** Case reports of patients with isolated osteoarthritis of the costovertebral joints treated with resection arthroplasty.

| Authors                               | Cases | Location   | Associated diseases | Country/year |
|---------------------------------------|-------|--|---------------------|--------------|
| Sales <i>et al.</i> <sup>[7]</sup>    | 5     | RT5, LC7 accessory rib, RT2, LT12 and LT5 – all cases CCJ. | None                | USA, 2007    |
| De Biase <i>et al.</i> <sup>[2]</sup> | 1     | RT10-CTJ.  | Not mentioned       | USA, 2021    |

CCJ: Costocorporeal joint

## CONCLUSION

The few case descriptions in the literature combined with this case indicate that resection arthroplasty of an osteoarthritis CVJ is the treatment of choice.

## Ethics

This case report was conducted in accordance with ethical standards of our university hospital and the local ethics committee.

## Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent.

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## Conflicts of interest

There are no conflicts of interest.

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