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Long-term Outcomes and Satisfaction Rates after Costal Cartilage Resection for Slipping Rib Syndrome

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Long-term Outcomes and Satisfaction Rates after Costal Cartilage Resection for Slipping Rib Syndrome

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Describe role of Submitting/Presenting Trainee in this project (limit 150 words):

Pediatric Surgery Research Fellow, primary author

Background, Objectives/Goal, Methods/Design, Results, Conclusions limited to 500 words

Background/Objectives/Goal: Slipping rib syndrome (SRS) is a challenging and underdiagnosed condition that has proven to be an elusive diagnosis due to an extensive differential with presenting symptoms that mimic a myriad of alternative diagnoses of both thoracic and abdominal pathology. The diagnosis of SRS is recognized in a patient with consistent, progressive, often debilitating unilateral or bilateral chest wall and/or upper abdominal pain with intermittent clicking or rib slipping. SRS frequently does not resolve with conservative management, including physical therapy, rest, and NSAIDs, as well as intercostal injections, and even opioid medications. Workup can be extensive including multiple subspecialty referrals and imaging studies that commonly contribute little to the diagnosis. Time to diagnosis is often years, which makes the condition frustrating for both the patient and clinician. Our institution previously published outcomes data for our cohort of pediatric slipping rib syndrome patients from 2006 – 2015. In this study, we aimed to report our updated outcomes, long term follow-up, and patient satisfaction for the largest series of pediatric SRS patients who underwent costal cartilage excision in the literature to date.

Methods/Design: Retrospective chart review with prospective telephone follow-up was performed for 30 previously analyzed patients and 22 new patients to elucidate risk factors for recurrence, discuss preoperative experience, current symptoms, postoperative course, and satisfaction.

Results: From 2006-2020, 49 patients met inclusion criteria and underwent 67 operations. Eleven underwent re-operation for recurrence, with median time of 1.6 years [1.2, 2.6] and recurrence rate of 24%. Median age of symptom onset was 13 years [11, 14] while median age at diagnosis was 15.4 years [14, 16.7].

29/49 (59%) patients were contacted, with median follow-up of 4.5 years [2.1, 5.7]. Twenty-one patients (72%) reported complete cure, 20 (69%) reported satisfaction 10/10, with 83% rating their satisfaction >7/10. Eleven patients (38%) were offered opioids for pain control prior to surgical evaluation. Patients with recurrence had residual or fused cartilage, hypermobile bony ribs, or both, at re-excision.

Conclusions: Costal cartilage resection is an effective treatment for SRS with high satisfaction rates and an appropriate consideration for patients who fail conservative management. Those with hyperflexible bony ribs and residual cartilage at the level of initial excision may be at higher risk for recurrence.

Table 1: Patient demographics and operative data at initial excision and re-excision

Patient Demographics (n = 49)	
Female	42 (86%)
Male	7 (14%)
Laterality at presentation	
Left	28 (57%)
Right	13 (27%)
Bilateral	8 (16%)
Age at symptom onset (years) ^γ	13 [11, 14]
Age at diagnosis (years) ^γ	15.4 [14, 16.7]
Time to index operation (years) ^γ	2.6 [1.8, 3.2]
Recurrence (patients)	11/49 (22%)
1 recurrence	8 (73%)
2 recurrence	3 (27%)
Time to first recurrence (years) ^γ	1.6 [1.2, 2.6]
Re-excision (operations)	14
Laterality to index operation	
Contralateral	3 ^a (21%)
Ipsilateral	7 (50%)
Bilateral	4 ^{b,c} (29%)
Same level	8 (57%)
Different level	6 (43%)

^γMedian [IQR]

^aThree patients developed metachronous contralateral symptoms requiring initial excision and subsequent re-excision for recurrence on this side. Initial contralateral excisions for new symptoms are not counted as recurrence.

^bAll index bilateral excisions recurred at the same levels bilaterally. One patient underwent bilateral resection after electing for index unilateral excision, despite presentation with bilateral symptoms.

^cOne patient underwent xiphoid excision with bilateral re-excision of costal cartilage

