

Background

Substernal goiters often require surgery, yet their location presents challenges. Most can be removed via transcervical approach [1], but extent and relationship to mediastinal structures can merit consideration of sternotomy and assistance of colleagues. Despite widespread use in sinus surgery and previous literature reports [2,3], microdebrider use to facilitate transcervical removal of substernal goiters has not been broadly adopted.

Methods

Reviewing thyroidectomies performed by a general otolaryngologist in a community setting from January 2017 through December 2019, four patients required microdebrider use for intracapsular debulking of substernal goiter to allow for transcervical removal.

Figures

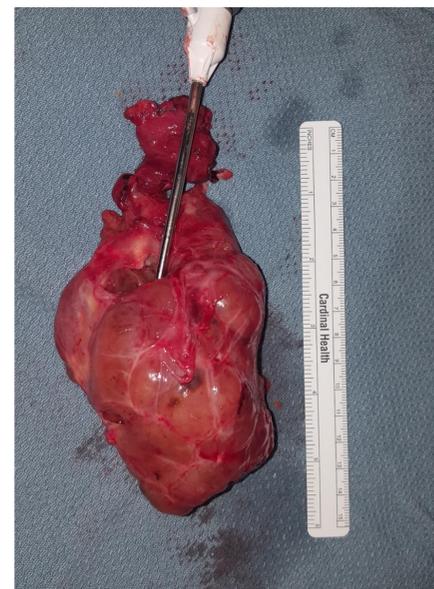
Figure 1. Coronal CT of Chest Patient 4



Figure 2. Demonstration of Technique



Figure 3. Massive Substernal Goiter after Debulking and Transcervical Removal



Clinical Pearls

1. Consider pre-operative CT evaluation to assess degree of substernal extension when the inferior aspect of the thyroid is not visualized on ultrasound, reported size is greater than 8 cm, or significant tracheal deviation is evident on physical exam or chest x ray.
2. Make sure the microdebrider is available for use if needed, and OR staff has comfort and familiarity with setup and operation.
3. Always keep the tip of the microdebrider blade under direct visualization, and keep the active surface pointed medially, "coring out" the central portion to minimize possible violation of the capsule and inadvertent injury to surrounding structures.
4. Less tissue removal than expected is typically needed to allow for improved manipulation and delivery of substernal portions through the inlet
5. Use a Lukens trap or similar tool collect removed tissue to send to pathology.

Tables

Table 1. Perioperative Data for Microdebrider Debulking of Substernal Goiters

Patient	Age	Length of Surgery (mins)	Blood Loss (mL)	Length of Stay (days)	Complications
1	67	121	150	1	Hematoma**
2	38	116	100	1	None
3	54	170	500	1	None
4	74	142	200	1	None
Average		137.25	237.5		
Range		54	400		

**Note: Estimated blood loss for hematoma evacuation was 350 mL.

Results/Discussion/Conclusion

Successful transcervical removal of substernal goiter without sternotomy cannot always be predicted pre-operatively. Microdebriders are familiar to all otolaryngologists due to frequent routine use during functional endoscopic sinus surgery, and decades of utilization has led to common practices to minimize risk of inadvertent injury to adjacent structures. After unsuccessful attempted removal via traditional dissection, the microdebrider can facilitate safe transcervical removal of substernal goiters. Adoption of this familiar tool and set of techniques for a different surgical application can reduce the need for sternotomy, assistance of colleagues, or referral to a tertiary care center, with associated in risk, morbidity, surgical time, length of stay, and cost, and improved patient convenience and satisfaction. The perioperative data for the four patients is listed in Table 1. Average estimated blood loss (EBL) was 237.5 ml. Average length of surgery (T) was 137 minutes. No patients required sternotomy. One patient developed post-operative hematoma requiring evacuation and cautery of a bleeding site. No other complications were encountered, all patients were discharged after overnight observation and no sternotomies were required.

References

- [1] Monchik JM, Materazzi G. The necessity for a thoracic approach in thyroid surgery. Arch Surg. 2000;135:467-471; discussion 471-472
- [2] Har-El G, Sundaram K. Powered instrumentation for transcervical removal of gigantic intrathoracic thyroid. Head Neck. 2001;23:322-325
- [3] Dagan E, Kleid S. Obviating the need for sternotomy: Safety and effectiveness of microdebrider use for retrosternal goiter. Head & Neck. 2018;40:837-841.