Robotic cricopharyngeal myotomy: A novel approach for treating cricopharyngeal hypertrophy

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Background

- Cricopharyngeal hypertrophy (often referred to as a cricopharyngeal bar) can result in significant oropharyngeal dysphagia[1,2]
- Various management options for cricopharyngeal bar exist, including botox injection, balloon dilation, and open myotomy (table 1)
- Open myotomy has long been considered the definitive treatment for patients who are appropriate surgical candidates, however, the 6-7 cm incision, likely post-op surgical drain, higher leak rates and 1-2 night minimum length of stay [3,4] has resulted in us searching for better ways to provide definitive treatment.

Treatment	Benefits	Weaknesses
Botox Injection	Quick, easy, minimal risk of complications	Often requires multiple injections for effect[5]
Balloon Dilation	Less invasive, high initial success rate	Risk of perforation, high rate of recurrence[3]
Open myotomy	High success rate and low rate of recurrence[3]	High rate of complications, often require hospitalization[3,4]

Table 1 Benefits and drawbacks of the current management options for cricopharyngeal hypertrophy

Methods

- Single-institution, retrospective case series involving eight patients with cricopharyngeal hypertrophy who underwent robot-assisted cricopharyngeal myotomy (CPM) with a single surgeon
- Primary objective: share our experience with this novel approach and present our patient outcomes

Technique

- Positioning: supine on a gel shoulder roll, arms tucked with slight rotation of head to the right
- EGD first to identify the area of maximal constriction (this area is then marked on the skin)
- Following antibiotics and injection of local anesthetic, a 3-cm incision is made along the anterior border of the sternocleidomastoid near skin markings
- Dissection through subcutaneous tissue until esophagus and cricopharyngeus are encountered
- The Da Vinci Xi robot is then positioned on patient's left side
- All 4 arms are free floating and hovering 2 inches above the operative field.
- Myotomy is then performed with two Maryland Bipolar graspers (arms 1 and 3) and an atrial fan retractor is placed in arm 4 for exposure
- An EGD is performed simultaneously to ensure that the area of narrowing has resolved
- The robot is removed from the field, hemostasis is ensured, and the 3cm wound is closed in multiple layers without drain placement
- Post-operatively: an esophagram is obtained in PACU with initiation of a liquid diet and discharge to home if no leak is identified. Routine follow-up is at 2 weeks.

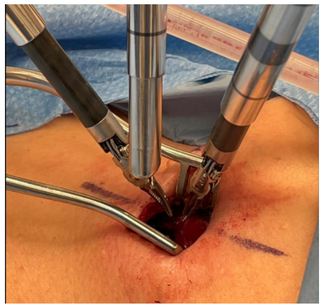


Figure 1 Configuration for performing a robotic-assisted CPM



Figure 2 Well-healed, 3 cm scar from robotic-assisted CPM

Results

Characteristic	Median (range) or *f (%)*
Age	65 (62-91)
Sex (female)	5 (62.5%)
Race (white)	8 (100%)
Ethnicity (non-Latino)	8 (100%)
OR time (minutes)	112.5 (94-141)
Length of stay (nights)	0 (0-1)
Diet resumption on day of procedure	8 (100%)
Complications intra-op or post-op	0 (0%)
Symptom improvement at 2-week follow-up appointment	8 (100%)
Recurrence	0 (0%)
Longest follow-up	11 months

Table 2 Patient demographics and outcomes

Type of CPM	Total one-day hospital cost
Robotic-assisted	$19,500
Open ***Each additional hospital day***	$18,000 *$2,500*

Table 3 Total one-day hospital cost for both robotic-assisted and open cricopharyngeal myotomies

Conclusions

✓ Robot-assisted CPM is safe and effective, with shorter incision length and improved precision of myotomy secondary to improved optics. This may result in decreased recurrence rates relative to other treatments.

✓ Patients can be discharged on a full liquid diet on the same day as the procedure so long as a leak is not identified on post-operative esophagram

✓ Robot-assisted CPM results in cost-savings compared to open CPM when taking length of stay into account

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