EsoSure® Esophageal Retractor

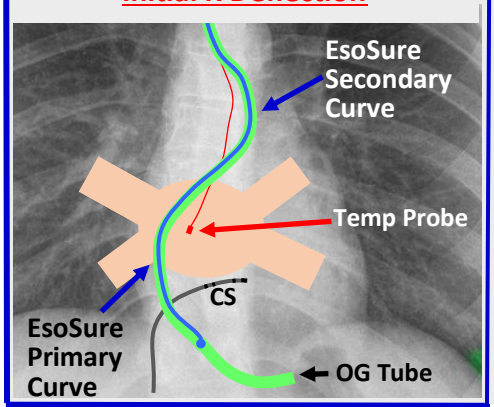
Training Sheet: Background

Clinical Support: 561-779-1040
Call, text, Skype or FaceTime.
Email: steve@epreward.com

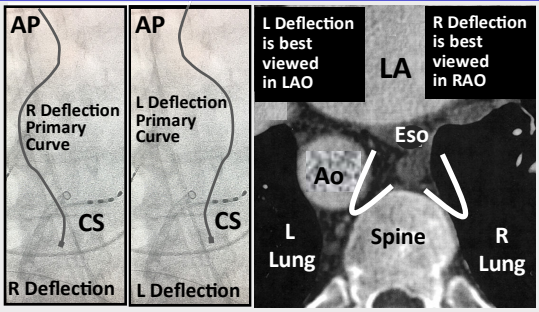
Anatomy Tips

- Use the spine as a Fluoro reference for the LA. L & R borders of the spine often = L & R sides of LA.
- The Coronary Sinus (CS) is the floor of the LA.
- Normal EsoSure deflection is from the R to L spinal border in AP.

Initial R Deflection

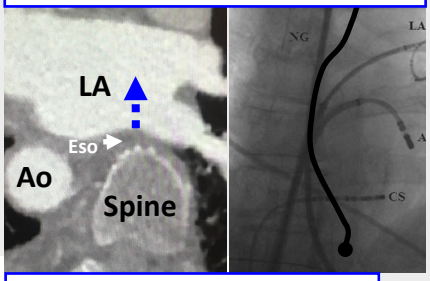


- View insertion & rotation in AP. Watching Fluoro, imagine the position of the EsoSure in 3D. Deflection occurs posterior-laterally between the lung and spine.
- Evaluate deflection from a perpendicular view: RAO for R deflection & LAO for L deflection.



If deflection is poor, use the ventilator to change the anatomy.

A narrow LA to spine distance may block deflection. Fluoro shows the EsoSure curve stops at mid-spine.

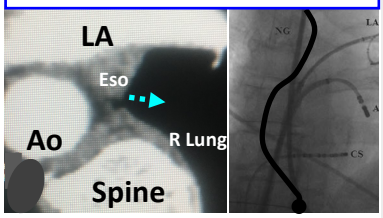


If deflection stops at mid-spine, use Valsalva

1) Rotate the primary curve to the desired side behind the trachea;
2) Have anesthesia give & hold a deep inspiration to lift the heart off of the spine;
3) Advance primary curve behind the LA. (If no CT, anticipate this is the situation.)

*If Valsalva fails, put primary curve to desired side behind trachea & advance ~1 cm q 5 sec.

The lung may reduce deflection. Curve doesn't reach spinal border.



If deflection crosses mid-spine but doesn't reach the spinal border, use Apnea

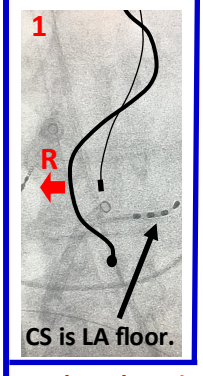
1) Ask Anesthesia to go apneic for 15-20 seconds to deflate the lungs;
2) Gently slide stylet ~4" in and out of OG Tube 2-4x to work the curve between spine & lung;
3) Position curve behind LA across from Rx area.

Contraindications are the same as for inserting an OG tube or TEE.

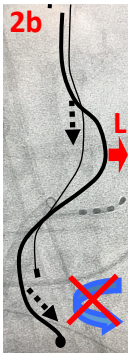
- Upper GI/esophageal disease or abnormalities, including a Hx of:
- Surgery, stricture, varices, hematomas, bleeding, tumors, severe a hiatal hernia, etc.

There are 3 EsoSure positions, and 2 ways to change from Right deflection to Left deflection

#1- R Deflection Primary Curve



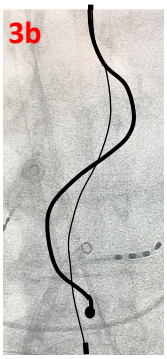
#2- L Deflection with Secondary Curve



a. Advance the Temp Probe into stomach.
b. Advance OGT/ EsoSure for L deflection with secondary curve.
c. Then retract Temp Probe.

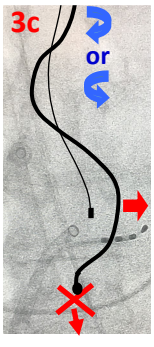
X When the primary curve is below the CS to the right, do not rotate the EsoSure, only retract it.

#3- L Deflection with Primary Curve



To use the larger primary curve for L deflection rotate the stylet:

a. Advance TP.
b. Retract the EsoSure from the OGT so the curve is above the CS.



c. Rotate handle 2-3 times, then slowly retract ~4" out of OGT, as rotation usually occurs above the heart. Watch with Fluoro. If it spins 360, rotate in the opposite direction.

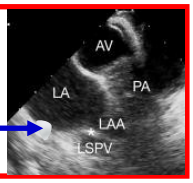
d. After rotation to correct side, release torque & advance curve to desired position.

X When the primary curve is to the left, do not advance the EsoSure past diaphragm, only rotate.

e. Then retract TP & position inside stylet's curve.

Safety Tips

- If resistance is felt while advancing the EsoSure, do not force it. Assess and decide.
- After deflection, visualize the trailing edge of the esophagus using Fluoro with contrast or ICE.
- After deflection, scan LA posterior wall with ICE for indentation on LA caused by displaced anatomy.



ESOSURE® Esophageal Retractor

Training Sheet: Procedure

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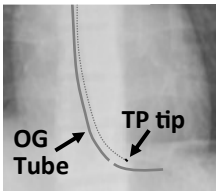
Equip

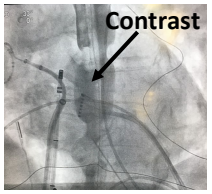
- 16 or 18 Fr 48" Salem Sump OG Tube (OGT). Not silicone.
- 20 cc syringe of room temp water/IV fluid to cool OGT & …
- EsoSure … 10 cc syringe for Tube Lube mid-procedure.
- Tube Lube is in ea box, for lubricating OGT lumen (Or olive oil).
- Esophageal Temp Probe (TP). Use a smooth shaft 9-12 Fr model and avoid Acoustascope models with a balloon over the thermistor/tip.
- Peds 4-5 mm ET tube or nasal trumpet airway to be placed orally as an introducer for 9 Fr TP.

Prep

1) Ask the patient about Contraindications. Esophageal/upper GI abnormalities.
2) Evaluate chest CT/MRI, if available, for a narrow LA to spine distance.
3) Endotracheal Intubation is preferred for EsoSure use. LMA is contraindicated.
4) Lubricate OGT lumen 2 ways: 1) If EsoSure use is known, suction Tube Lube through OGT from packet before OGT insertion. 2) If EsoSure use is decided mid-procedure, use 10 cc syringe to inject through OGT when use confirmed.
5) Lubricate TP & OGT shaft with Surgilube. Insert OGT & TP before Heparin. Use a Peds 4-5 mm ET or nasal trumpet (orally) as an introducer for 9 Fr TPs.
6) Insert OG Tube prior to anticoagulation and remove if EsoSure is not used. Confirm OGT & TP are in the stomach with Fluoro. Insert OG Tube to ~55 cm.
7) Evaluate baseline position of esophagus to plan deflection work flow.
8) Inject contrast after transseptal:
   a) Verify OGT in stomach c Fluoro.
   b) Retract OGT tip just below CS.
   c) Inject 10-20 cc contrast slowly.
   d) Adjust OGT up/down as needed.
   e) Re-advance OGT into stomach.

Contrast is not required but is recommended.





Insert

1- Bolus Propofol or sedatives to relax airway & avoid a gag reflex. Wiggle ET tube if unsure. Inject Tube Lube in OGT if not already lubricated.

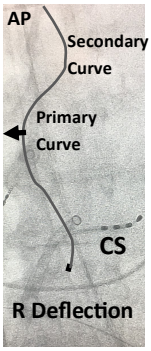
2- Open & align airway, in sniffing position by a second person. A two handed head tilt-jaw lift will align oral-esophageal axis for easier insertion.

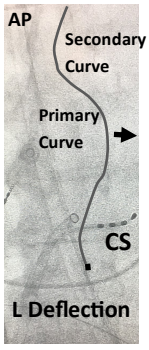
3- Cool OGT to slow stylet's curving,

by injecting 20 cc room temp IV fluid/water through OGT connector over 5-10 sec. Hold OGT so it is angled up 45° & straight from mouth.

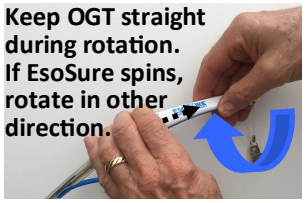
Position

4- Advance EsoSure 2-3" at a time, immediately after injecting cool fluid. Keep OGT straight & watch with Fluoro past throat. * Advance OGT & EsoSure together if tip stops above CS. Stop when EsoSure tip is past CS or primary curve is at upper heart.





5- Rotate primary curve to the desired side. With the primary curve behind the heart, rotate the handle 2-3 times and slowly retract ~4" out of OGT. Rotation usually occurs behind the trachea. Then advance the primary curve back down behind the left atrium.

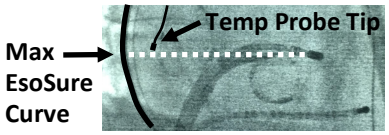


* If stylet stops advancing, the most common cause is a loop in OGT. To resolve, retract stylet ~2", fix stylet position and retract OGT over the stylet 2" 3X, then re-advance the stylet. If it won't advance look with Fluoro & remove if no loop.

Finish

6- Initiate a Valsalva if esophagus does not cross mid-spine: Rotate primary curve to the desired side behind the trachea, then during a Valsalva advance the curve behind the heart. **If deflection passes mid-spine but is minimal:** Go Apneic for ~20 sec, then slide EsoSure 4" in and out of OGT 2-3 times.

7- Temp Probe is positioned inside maximum EsoSure curve across from treatment area.



8- Assess the esophageal trailing edge with Fluoro & contrast, or US, while sliding EsoSure in and out to wiggle esophagus. Last, use US to check LA posterior wall for possible indentation.

EsoSure Removal:

- Keeping the stylet tip above the diaphragm, hold the end of the OGT and smoothly slide the EsoSure out and in ~4" 2X to slide the esophagus R & L behind the LA. It is hypothesized that side to side esophageal movement may break potential thermal adhesions between tissue layers.
- Lastly, pull EsoSure out of the OGT and suction the stomach & esophagus, especially if contrast was used.