

FEEDBACK TO THE FIELD (FT2F) #8: *Cricothyroidotomy Observations* *

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** American Registry of Pathology in support of AFMES

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Original Release

FEEDBACK TO THE FIELD (FT2F): CRICOTHYROTOMY OBSERVATIONS

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BACKGROUND

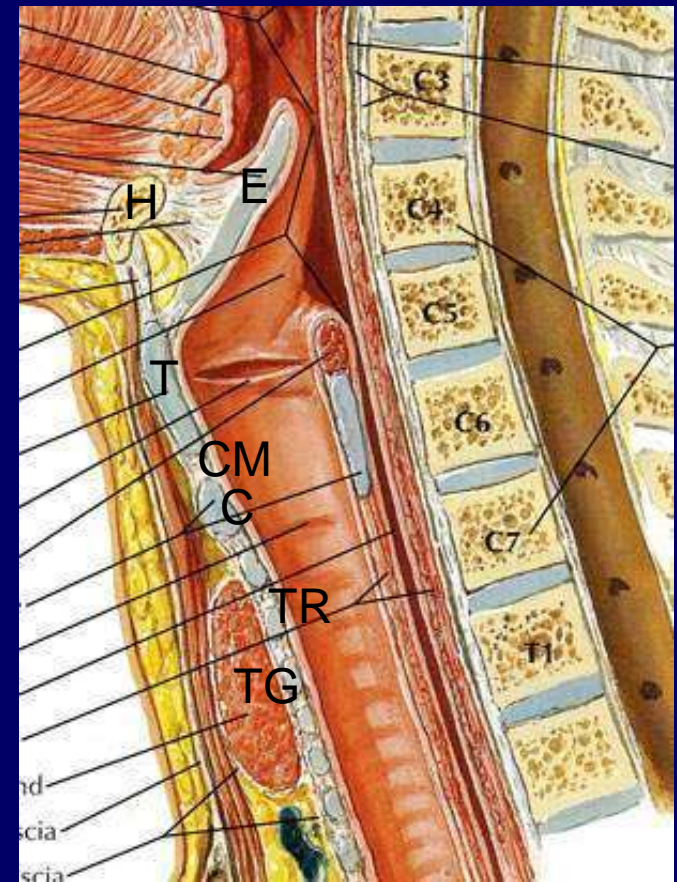
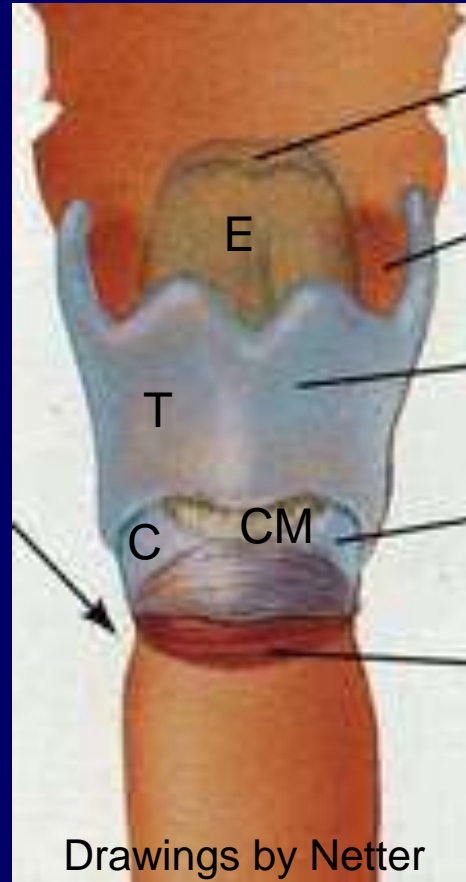
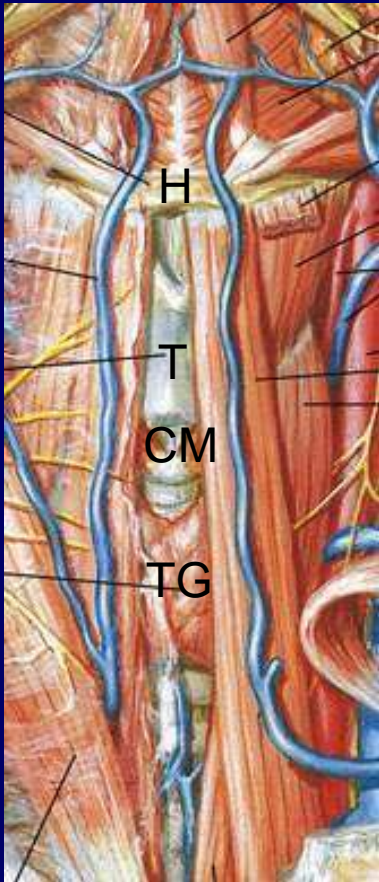
- Previously released FT2F reported on high placement of cricothyrotomies penetrating laryngeal structures.
- This prompted a review of cricothyrotomies with respect to type of tube used and placement.
- The clinical circumstances and specific details surrounding the reviewed cricothyrotomies are unknown. All cases are of Service Members autopsied at the Port Mortuary, Dover AFB, DE

BACKGROUND

- Cricothyrotomy (CR) is seen relatively infrequently compared to endotracheal intubation (EI): 13 CR vs 55 EI*.
- Variation exists in the equipment with both cricothyrotomy and supraglottic tubes used.

*Data are based on cases with airway equipment present at autopsy (June through December 2010).

OVERVIEW OF ANATOMY:



Key Anatomic Landmarks: Thyroid Cartilage (T), Cricoid Cartilage (C), Hyoid Bone (H), Cricothyroid Membrane (CM), Thyroid Gland (TG), Epiglottis (E), Trachea Rings (TR)

PARAMETERS FOR STUDY: 13 Cases

- Location of Entry:
Above CM*, at CM, Below CM
- Type of Incision
Vertical, Horizontal, Not Classifiable
- Type of Device
Manufacturer, Size by I.D.**
- Position of Device
In Trachea, Not in Trachea

*CM= Cricothyroid Membrane

**I.D.= Internal Diameter in mm

Manufacturer	Internal Diameter Size (mm)	Number
King LT-D #4	10.0	1
Portex	8.0	2
	6.0	2
	5.0	1
	Unknown	1
AirCare	6.0	2
Sheridan	7.0	2
Mallinckrodt	7.0	1
	6.0	1

Internal Diameter Frequency	
10mm	1
8mm	2
7mm	3
6mm	5
5mm	1
Unkn	1

Cricothyrotomy Incision	Number of Cases
Vertical	8
Horizontal	0
Unclassified*	5

* Unable to definitively determine presence/orientation of a surgical incision.

ILLUSTRATIVE CASE 1

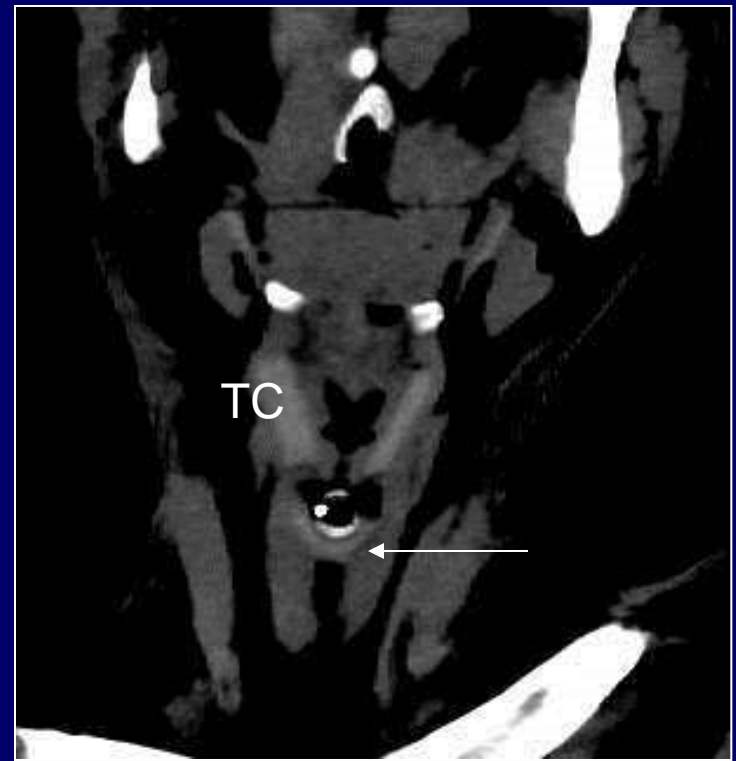
Portex 6.0 I.D.

Placed through vertical
incision.

Entered trachea through
the cricothyroid
membrane.

Tube in the trachea.





CASE 1

Sagittal and coronal CT shows tube in the trachea passing through the cricothyroid membrane (between the thyroid cartilage (TC) and cricoid cartilage (arrow)).

ILLUSTRATIVE CASE 2

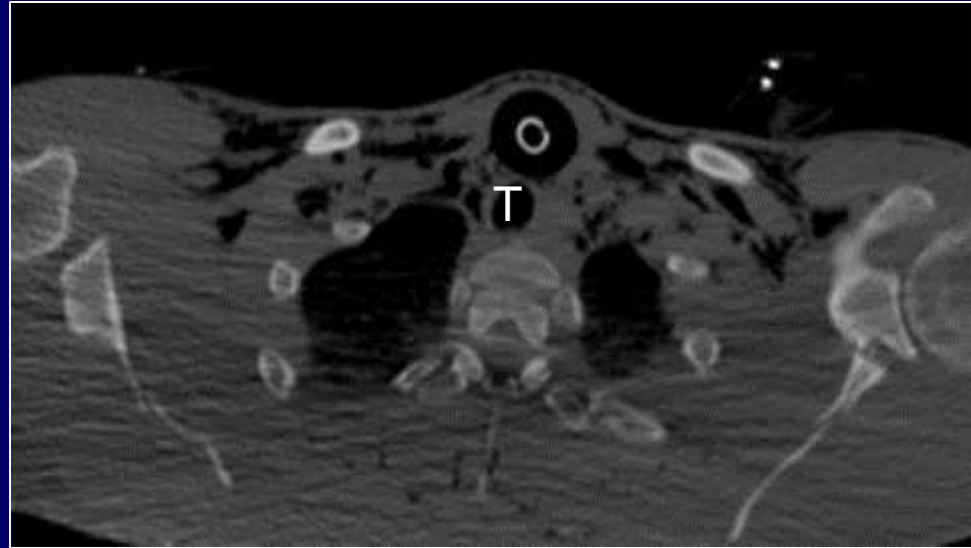
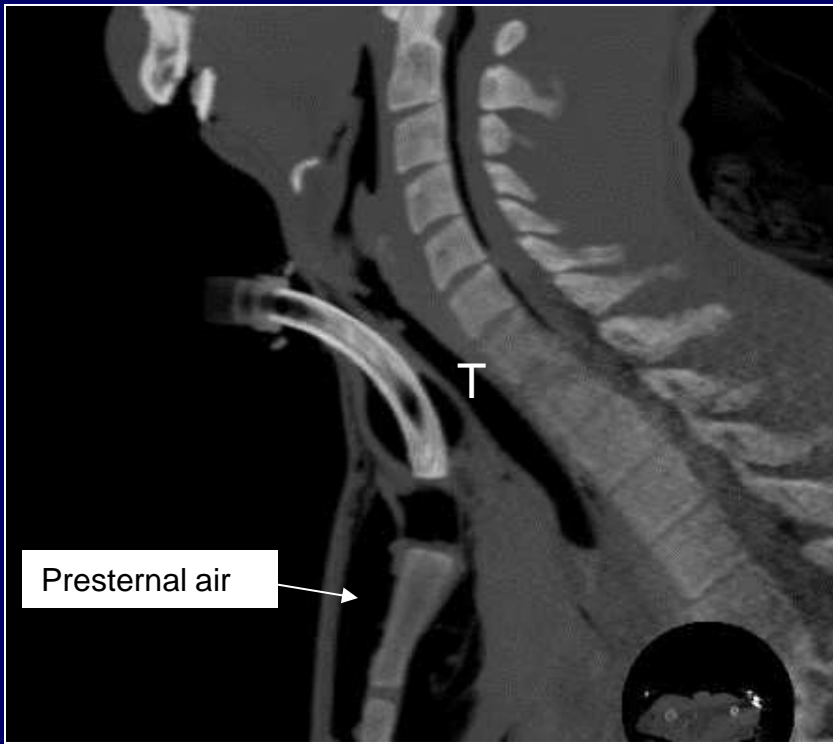
Portex 8.0 I.D.

Placed through vertical
incision.

Entered trachea through
the cricothyroid membrane.

Tube did NOT enter the
trachea.





CASE 2

Sagittal and axial CT shows the tube anterior to the trachea (T) after entering the neck at the level of the cricothyroid membrane.

Note: Presternal (arrow) and retrosternal air.

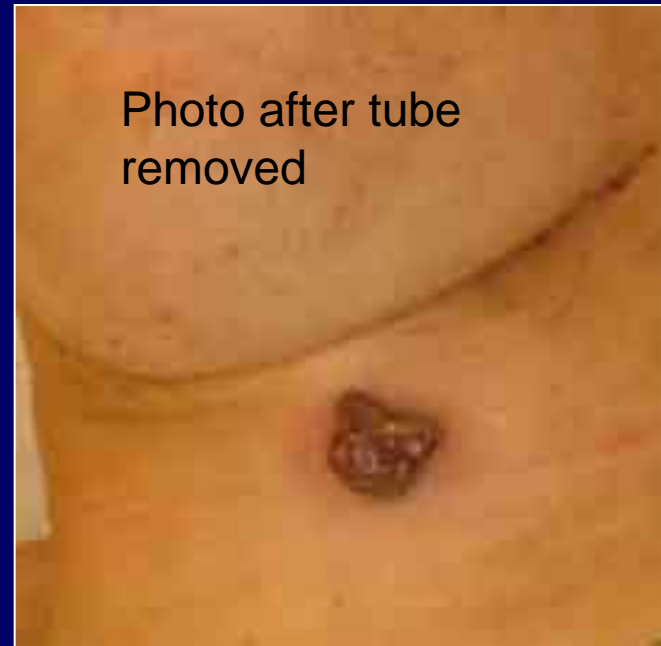
ILLUSTRATIVE CASE 3

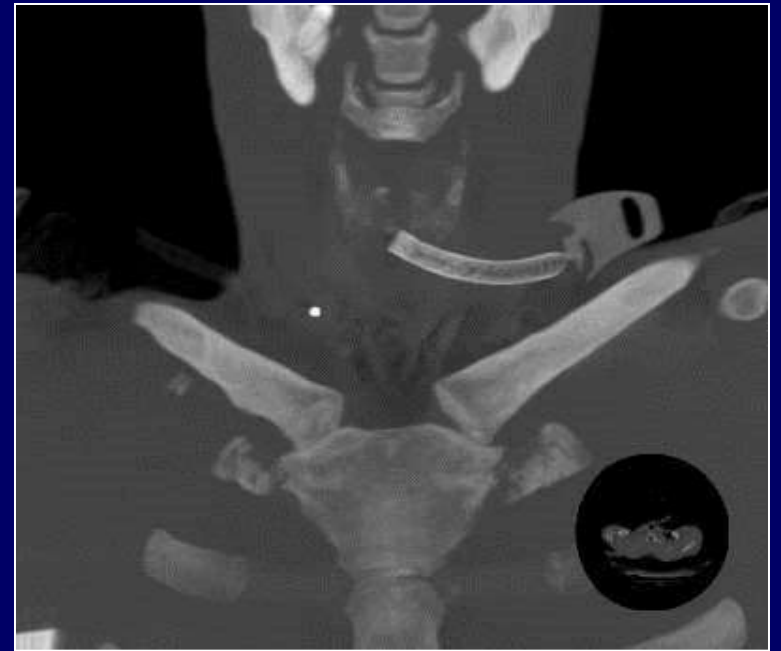
Portex 6.0 I.D.

Placed through vertical incision.

Tube entered neck above the cricothyroid membrane.

Tube did NOT enter the trachea.





CASE 3

Axial, coronal and sagittal CT shows the tube in the soft tissue anterior to the thyroid cartilage and not entering the trachea (T).



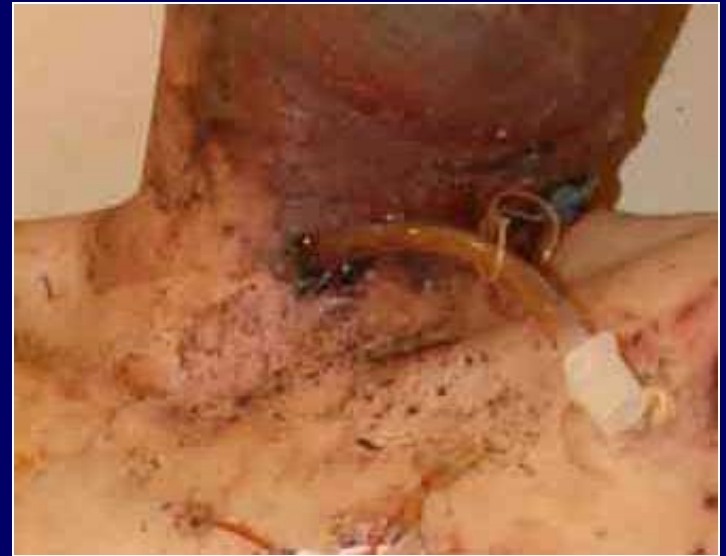
ILLUSTRATIVE CASE 4

AirCare 6.0 I.D.

Placed through
unclassifiable incision.

Entered trachea below the
cricothyroid membrane.

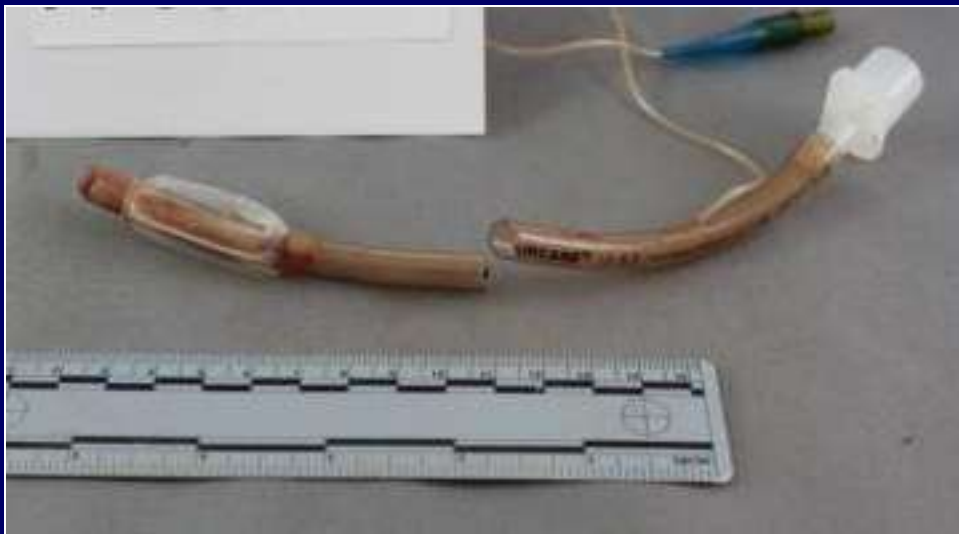
Tube in the trachea.



CASE 4

Sagittal CT shows tube position in the trachea.

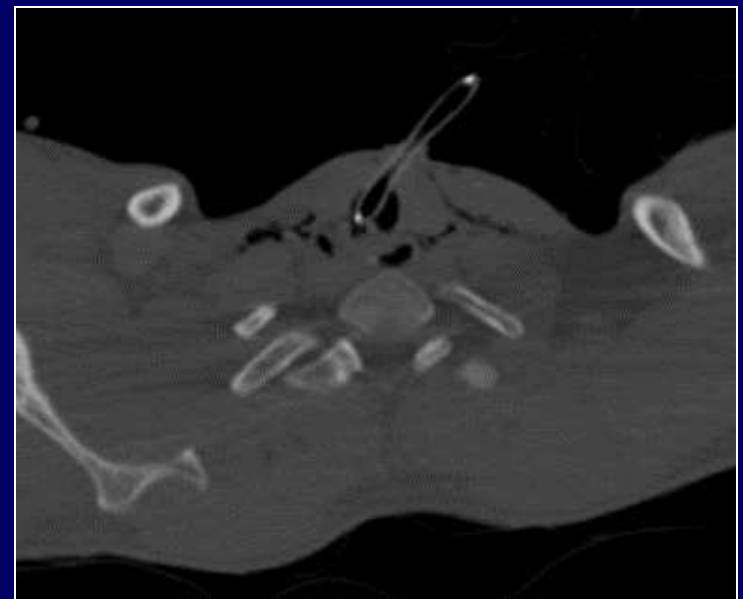
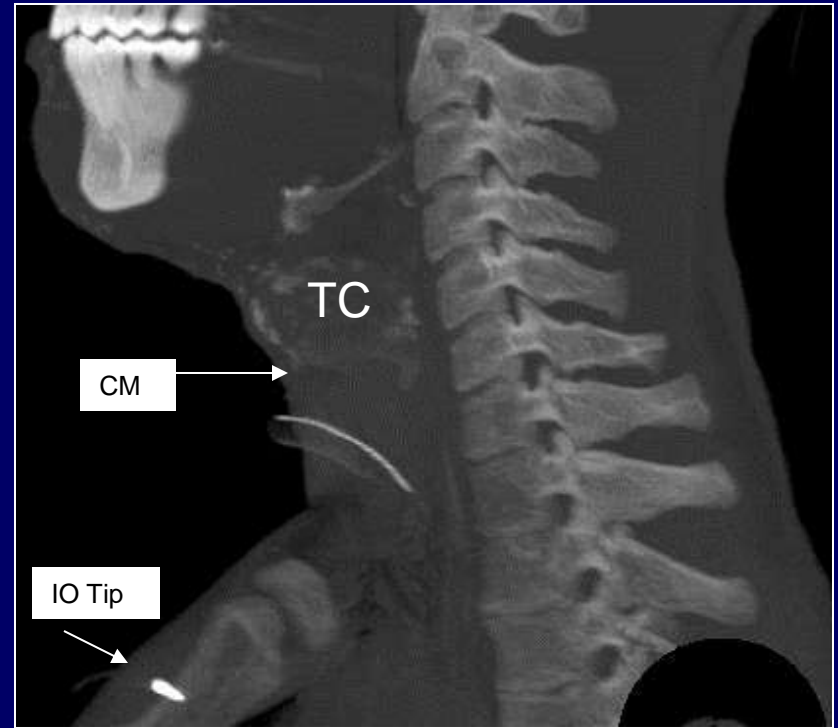
[Tube cut during removal]



CASE 4

Sagittal and axial CT documents entry below the cricothyroid membrane (CM).

Note: thyroid cartilage (TC) and IO-IV tip in sternum.



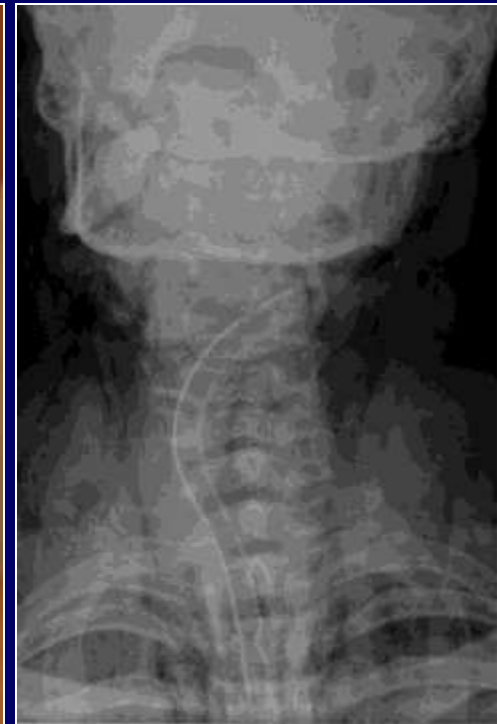
ILLUSTRATIVE CASE 5

AirCare 6.0 I.D.

Placed through a vertical
incision.

Entered trachea at
the cricothyroid
membrane.

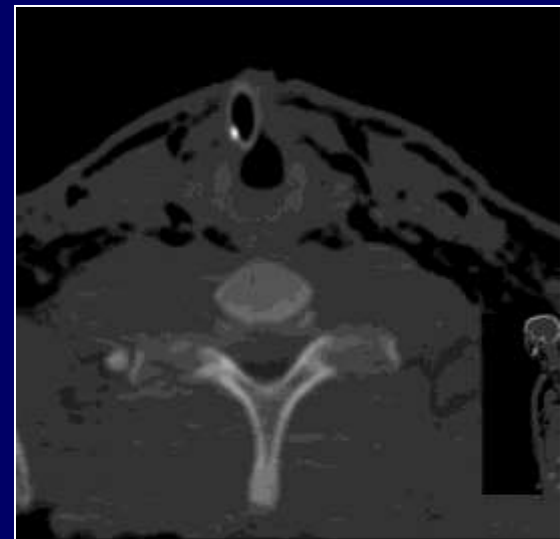
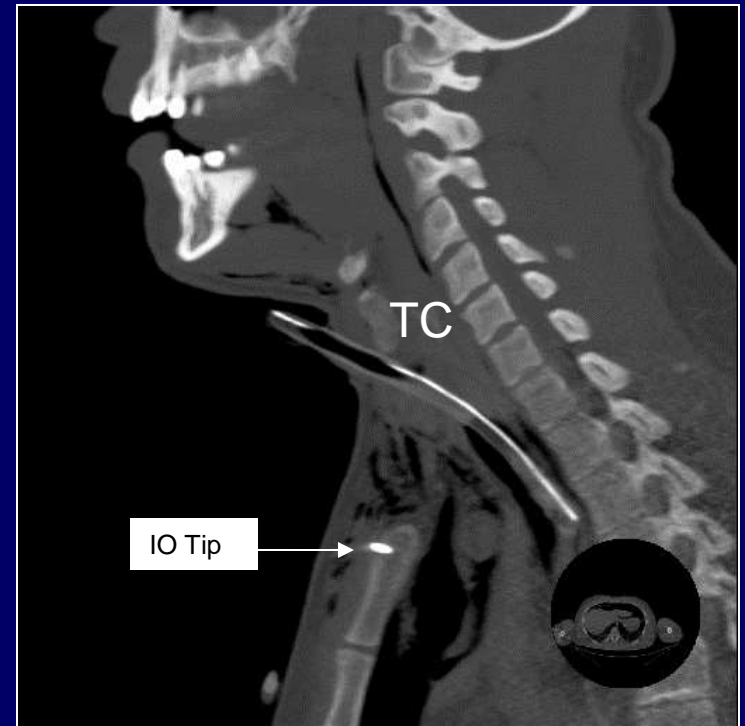
Tube in the trachea.



CASE 5

Sagittal and axial CT documents entry at the cricothyroid membrane.

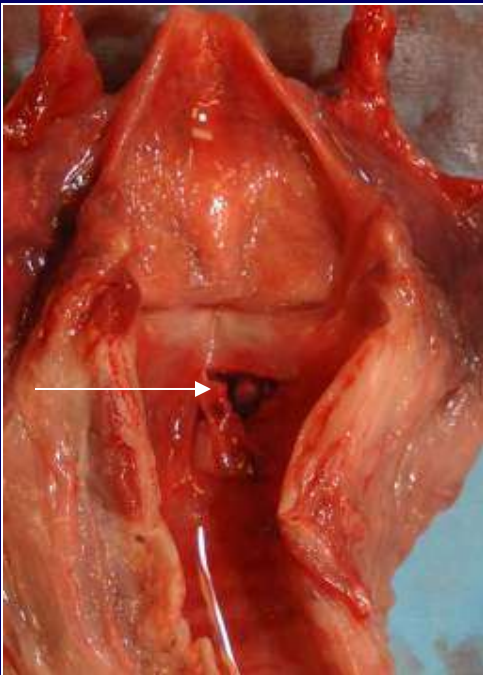
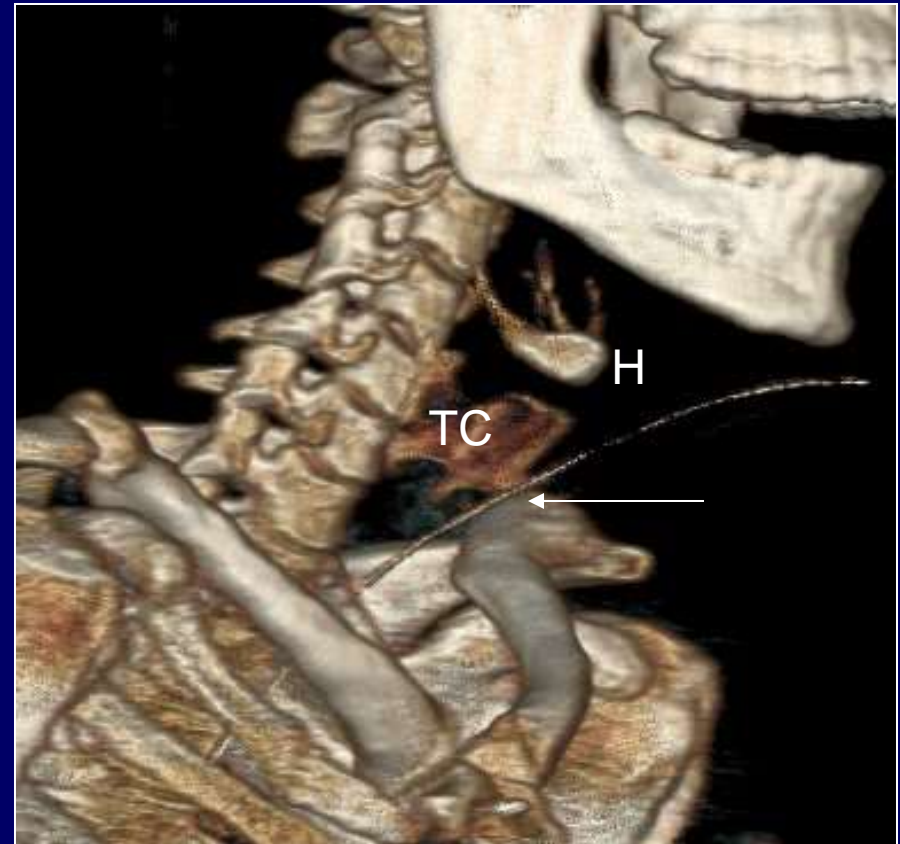
Note: thyroid cartilage (TC) and IO-IV tip in sternum.



CASE 5

3D CT shows tube entry (arrow) with regard to cervical landmarks.

(H = Hyoid Bone, TC = Thyroid Cartilage)



Autopsy photo – posterior access of trachea confirms tube entry at cricothyroid membrane (arrow)

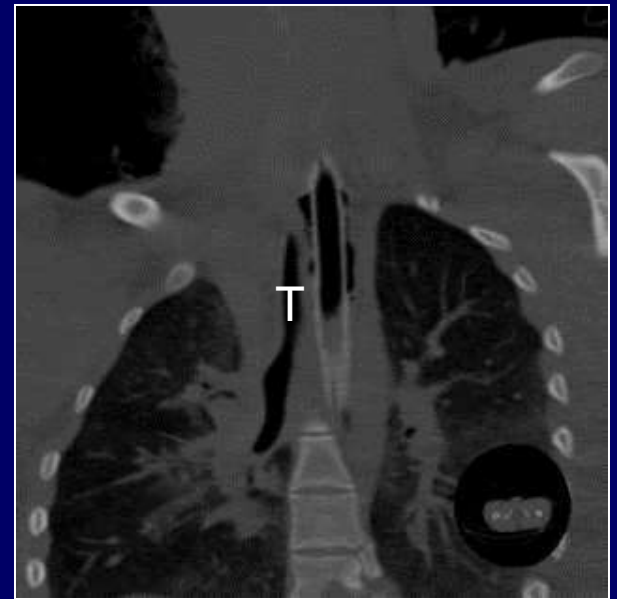
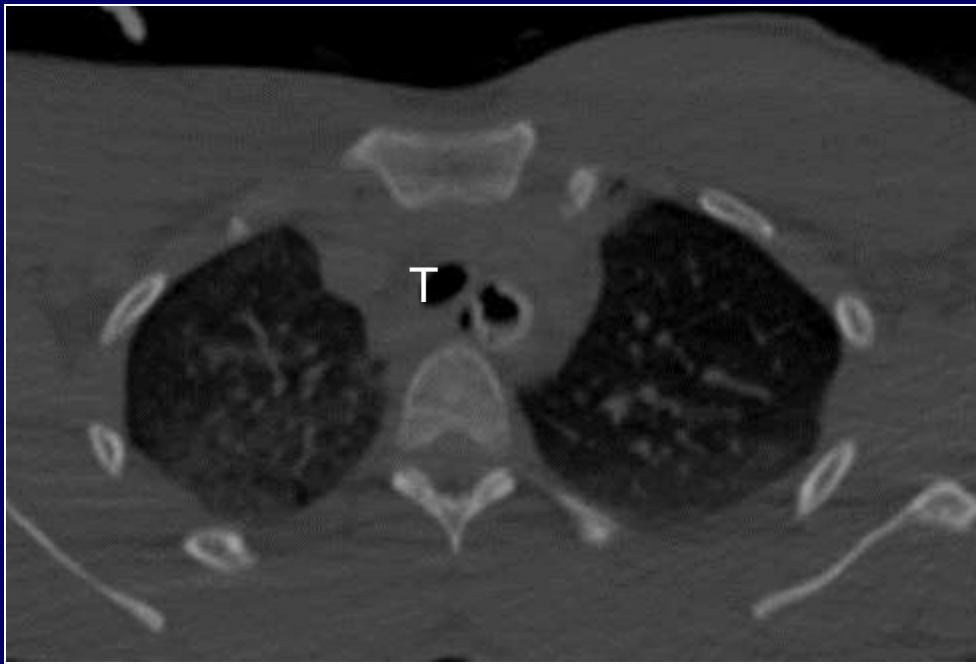
ILLUSTRATIVE CASE 6

King LT-D #4, 10 mm I.D.

Placed through neck wound
above the CM - unclassifiable
incision.

Tube entered the wound,
passed directly into the
esophagus.





CASE 6

Axial, sagittal and coronal CT:
tube in the esophagus,
deviated to the left and behind
the trachea (T).

Note: vented portion of the tube at the level of
the thoracic inlet (arrow).

SUMMARY

A variety of tubes were used to include supraglottic varieties, most were 6.0 mm and 7.0 mm I.D.

Most cricothyrotomies were vertical incisions at the cricothyroid membrane.

Tube position outside the trachea was noted in 3 of 13 cases.

Caution:

This presentation makes no association between cricothyrotomy parameters and patient outcome.

The clinical circumstances and specific details surrounding the delivery of emergency treatment in these cases is unknown.

DMMPO RECOMMENDATIONS / ACTIONS

- Services evaluate cricothyrotomy procedures and equipment
 - Which devices are being taught?
 - Review training techniques & procedures

FUTURE CONSIDERATIONS

- Standardization of Airway Equipment
- Evaluate & Update Training Procedures
- Establish Acquisition Process for Airway Devices

This material is intended for educational and training purposes. If portions are extracted, the following statement must be included:

“Source: Armed Forces Medical Examiner System and DHA Medical Logistics Division”

NOTES of CAUTION:

- The clinical circumstances and details surrounding emergency treatment in these cases is unknown
- This presentation makes no association between device placement and outcome of treatment
- This case series is drawn from cases with fatal injuries, which may skew data

For FT2F Comments / Questions / Requests:
Contact the Armed Forces Medical
Examiner System (AFMES)

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