

Airway POCUS – Fact or Fiction?

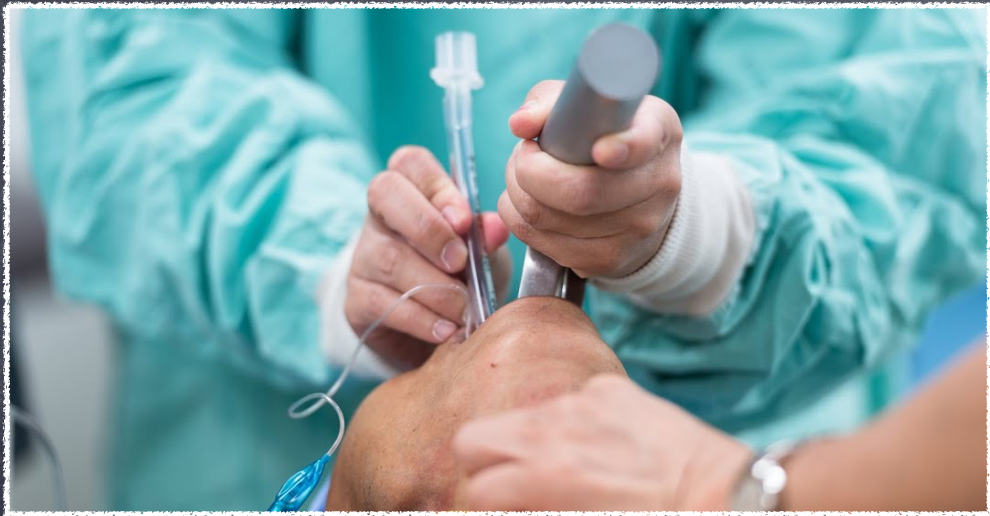
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Vancouver Pocus Symposium 2019

Disclosures

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Objectives

- POCUS for confirmation of endotracheal intubation
- POCUS for cricothyroid membrane landmarking



POCUS Confirmation of
Endotracheal Intubation

Evidence

Ultrasonography for the Confirmation of Endotracheal Tube Intubation: A Systematic Review and Meta-Analysis

Michael Gottlieb, MD, RDMS*; Dallas Holladay, DO; Gary D. Peksa, PharmD

Sensitivity: 98.7%

Specificity 97.1%

Which technique?

Comparison of techniques for visualisation of the airway anatomy for ultrasound-assisted intubation: A prospective study of emergency department patients

Michael J. Romano^{a,b}, Jacques S. Lee^{a,b}, Jordan Chenkin^{a,b,*}

Suprasternal notch with pressure left of trachea provides most consistent adequate airway visualization (93%)

Which technique?

Comparison of techniques for visualisation of the airway anatomy for ultrasound-assisted intubation: A prospective study of emergency department patients

Michael J. Romano^{a,b}, Jacques S. Lee^{a,b}, Jordan Chenkin^{a,b,*}

Left of SSN (93%) > SSN pressure (82%) > CTM (74%)

Let's do it!

Equipment



Technique

DYNAMIC or
STATIC?

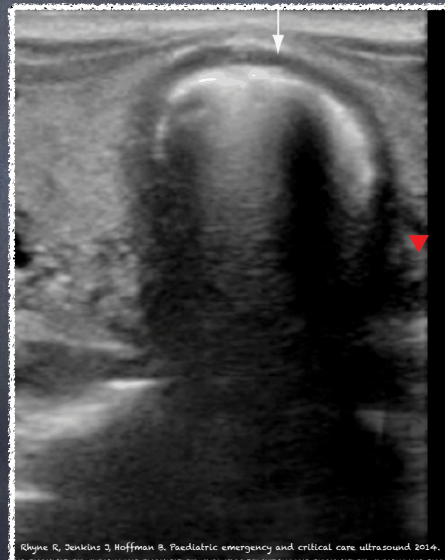


Figure 2. Dunbar J Hoffman R. Pediatric emergency and critical care ultrasound 2014.

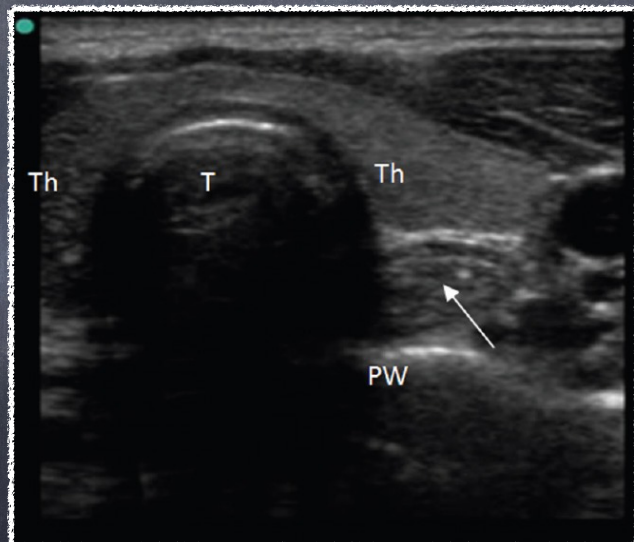
Technique

Place probe
transverse at the
level of the
suprasternal
notch

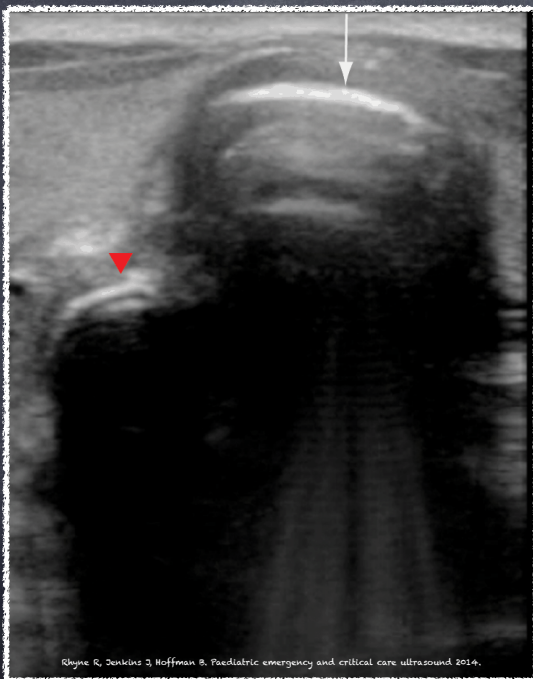
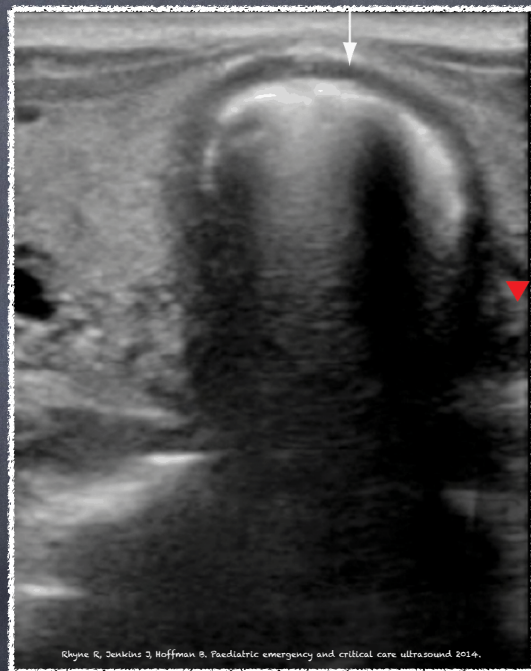


Technique

Identify the
trachea and
esophagus



ONE air-mucosal
interface =
endotracheal
intubation



TWO air-mucosal
interfaces =
esophageal
intubation



ED Application

- Adjunct to confirmation
- Low resource settings
- No capnography
- Cardiac arrest





POCUS Landmarking for Cricothyrotomy

What about palpation?

The Inaccuracy of Using Landmark Techniques for Cricothyroid Membrane Identification: A Comparison of Three Techniques

Aaron E. Bair, MD, MS, and Rupinder Chima, MD

Accuracy of identifying the cricothyroid membrane by anesthesia
trainees and staff in a Canadian institution

Exactitude du repérage de la membrane cricothyroïdienne par des
stagiaires et des patrons en anesthésie dans un établissement
canadien

Austin Lamb, MD · Jinbin Zhang, MBBS · Orlando Hung, MD ·
Bruce Flemming, MD · Tim Mullen, MD · Mary Beth Bissell, MSc ·
Iain Arseneau, BSc

Localisation of the cricothyroid membrane by digital palpation in the emergency department

Hiba Alshareef,¹ Abdulaziz Al Saawi,¹ Faisal Almazroua,¹ Hadi Alyami,¹
Gerard O' Reilly,^{2,3} Biswadev Mitra^{2,3}

What about palpation?

The Inaccuracy of Using Landmark Techniques for Cricothyroid Membrane Identification: A Comparison of Palpation and Ultrasound

Aaron E. Bair, MD, MSc

CTM localized accurately **30-60%**

membrane by anesthesia
n
cricothyroïdienne par des
s un établissement

Localisation of the Cricothyroid Membrane by Palpation in the emergency department

Hiba Alshareef,¹ Abdulaziz Al Saawi,¹ Faisal Almazroua,¹ Hadi Alyami,¹ Gerard O' Reilly,^{2,3} Biswadev Mitra^{2,3}

Can we do better?

Ultrasound Is Superior to Palpation in Identifying the Cricothyroid Membrane in Subjects with Poorly Defined Neck Landmarks

A Randomized Clinical Trial

Naveed Siddiqui, M.D., M.Sc., Eugene Yu, M.D., R.C.P.S.C., A.B.R., Sherif Boulis, M.D., F.R.C.P.C., Kong Eric You-Ten, Ph.D., M.D., F.R.C.P.C.

U/S accurately identified CTM **81%** vs. external palpation **8%**

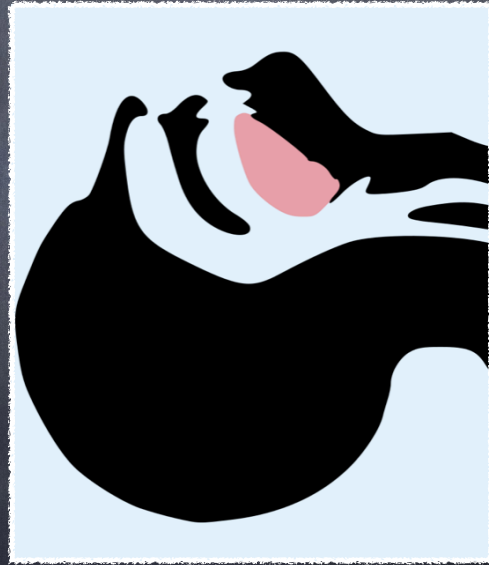
Let's do it!

Equipment

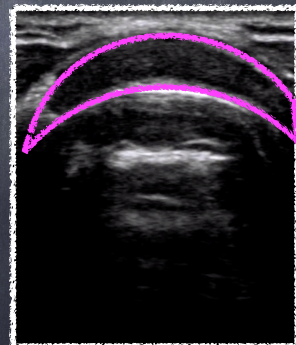
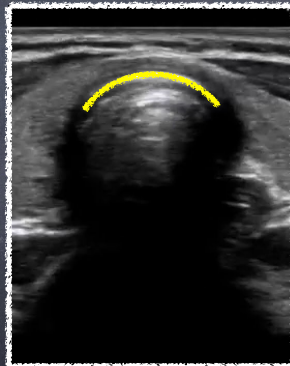


Patient Positioning

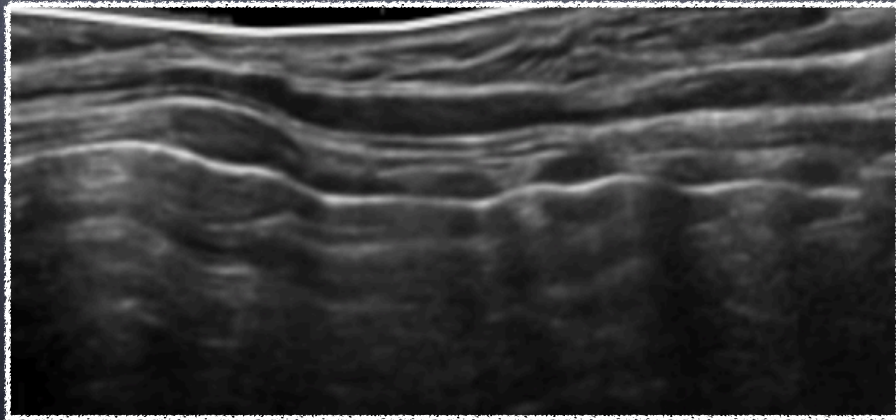
- Supine
- "Sniffing" position



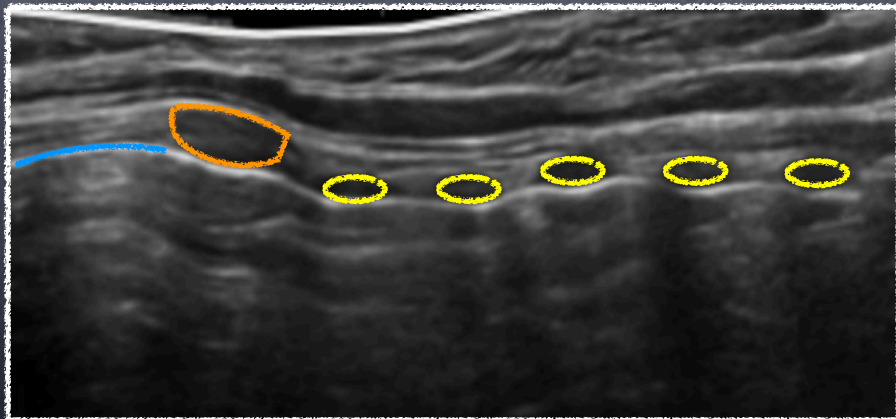
Technique: TACA



Technique:
Longitudinal



Technique:
Longitudinal



ED Application

Anticipated difficult airway

+

Poorly defined neck
anatomy

Summary

- Accurate for ETT confirmation
- 1 air-filled lumen = tube is in!
- POCUS is superior to palpating CTM
- TACA + string of pearls