

Journal Club 7/31/06

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- P** All intubated patients in our ED
- I** Does measuring/adjusting endotracheal cuff pressure with a manometer
- C** vs. standard syringe inflation
- O** decrease tracheal morbidities

Clinical Scenario: You have just intubated and stabilized an asthmatic patient in the emergency department who has a history multiple intubations. You wonder about the patients risk of developing tracheal morbidities associated with intubation and if the cuff you just inflated is causing them.

Search Strategy: using endotracheal tube cuff pressure

Cochran Library: 0 reviews, 60 hits

Best Bets: 0 cats

Pub Med : multiple studies

Relavant points and studies:

1. Does Cuff pressure (high or low) cause any symptoms or morbidity

- Yes!!, generally accepted that elevated pressure causes sore throat, dysphagia, nerve palsy, vocal cord paralysis, stridor, tracheal stenosis, stridor, tracheal-esophageal fistula, and tracheal rupture.
- Low pressure: aspiration

2. Can physicians estimate cuff pressure without a manometer?

Author, date, Country	Pt group	Study type	Outcomes	Key results	Study weakness
Hoffman, R 7/05 New York, USA Am J of EM	41 faculty EM physicians 9 tracheal sim models	Prospective, Observational Cross sectional	Cuff pressure prod Estimate of cuff Pressure Manometer "cufflater"	90% inflated >120 cm avg was 93.2 cm range 16-120 95% interval 82-104 22% detected overinflated cuffs	Tracheal simulation 16-25 range may not be clinical relevant in all pts
Galinski, m 6/06 France Annals of EM	107 pts 85 out of hospital 22 transfers	Observational Prospective	First recorded cuff Pressures using a Manometer	79% > 27 cm Out of hospital Avg 56 cm SD +/- 34 Transfer avg 69 cm SD +/- 37	Not blinded Heavy bias No calibration of device

3. Does monitoring cuff pressure with a manometer decrease symptoms or morbidity

Author,date, Country	Pt group	Study type	Outcomes	Key results	Study weakness
Suzuki,N 10/99 Japan	190 ASA class I & II Adults < 15 mm 15-25 mm	Randomized Control Trial	P/Op hoarsness & sore throat @ 24 hrs and 7 days	<15 mm group sig decrease in complaints @ 24 hrs. No diff @ 7 days	Not blinded
Garcia JA, 2001 Mexico	A < 42 mm B>42 mm 40 adults	RCT	“tracheal pain” @ 60 min & @ 24 hrs	Similar @ 60 min 10% of A @24 hrs 53.3% of B @ 24 hrs P -0.02 Correlation 0.76, P= 0.00001	Not blinded Low #s No long term Effects noted

Comments: Elevated cuff pressures greater than 30 cm water can cause histologic mucosal injury within 15 minutes. It is unknown how much time, if any, is a safe duration during which excess cuff pressure may be tolerated without injury. Pressures above 45 cm cause obliteration of capillary flow in the trachea. Sore throat, dysphagia, and more severe morbidities have been attributed to elevated cuff pressures. The pathological process of stenosis is thought to begin with tracheal tube pressure on the laryngotracheal mucosa, especially when the tube is too large or when the cuff is too inflated, causing mechanical oedema and ischaemic necrosis, followed by organisation into fibrotic tissue. Physicians (EM and Anesthesiologists) cannot reliably predict cuff pressure via palpation, predetermined quantity, nor inflation till no leak occurs. It has also been shown that frequent/continuous monitoring of cuff pressure during OR cases has decreased pain, and other tracheal morbidity. Manometers or other like measuring devices have been shown to reliably measure cuff pressure without significant user experience.

Clinical Bottom Line:

Overinflated endotracheal tubes cause morbidity.

We stink @ measuring cuff pressure “clinically”.

Measurement of Cuff pressure post intubation and of all received pts in the ED would be beneficial to the patient.