



Personalizing Intubation: Analysis of ETT Size Selection Relative to Height in Airway Injury Cases



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INTRODUCTION

- Post-intubation airway injury is a clinically significant but **underrecognized** complication.
- Endotracheal tube (ETT) size is a modifiable risk factor for airway management.
- No standard method to choose ETT
- Lack of individualization may increase risk for:
 - Mucosal Trauma
 - Prolonged Hoarseness
 - Subglottic Stenosis

Primary goal: To evaluate patterns of ETT size selection in relation to patient height among individuals who developed intubation-related airway injuries at a single academic center.

METHODS

Design: Retrospective review of adult patients (≥18 years) with documented intubation-related airway injury.

Groups: Recommended ETT sizes were defined as 7.0 mm for patients ≤160 cm, 7.5 mm for those 161–179 cm, and 8.0 mm for patients ≥180 cm. Each case was classified as:

1. **Smaller-than-recommended,**
2. **Appropriate-for-height,**
3. **Larger-than-recommended**

Data: Demographics, ETT size, height, gender, and duration of intubation were collected.

Analysis: Distribution of ETT sizes across height-based recommendation categories and comparison to intubation duration.

RESULTS

Patient Characteristics

- Most patients were obese (BMI >30).
- Many were intubated for more than 7 days.

ETT Size Distribution

- The 7.0 mm ETT was the commonly used size.
- Use of larger tubes (7.5–8.0 mm) was also frequent.
- A small number of patients received 6.0 mm tubes.

ETT Classification of Patients

- Over half of patients received tubes smaller than height-based recommendations (Figure 1).
- Women were more often in the small-for-height group. All large-for-height cases were men (Figure 2).
- Most patients under 175 cm received 7.0 mm tubes, and few taller individuals were given the larger sizes recommended by guidelines.
- This suggests a non-individualized approach to airway management.

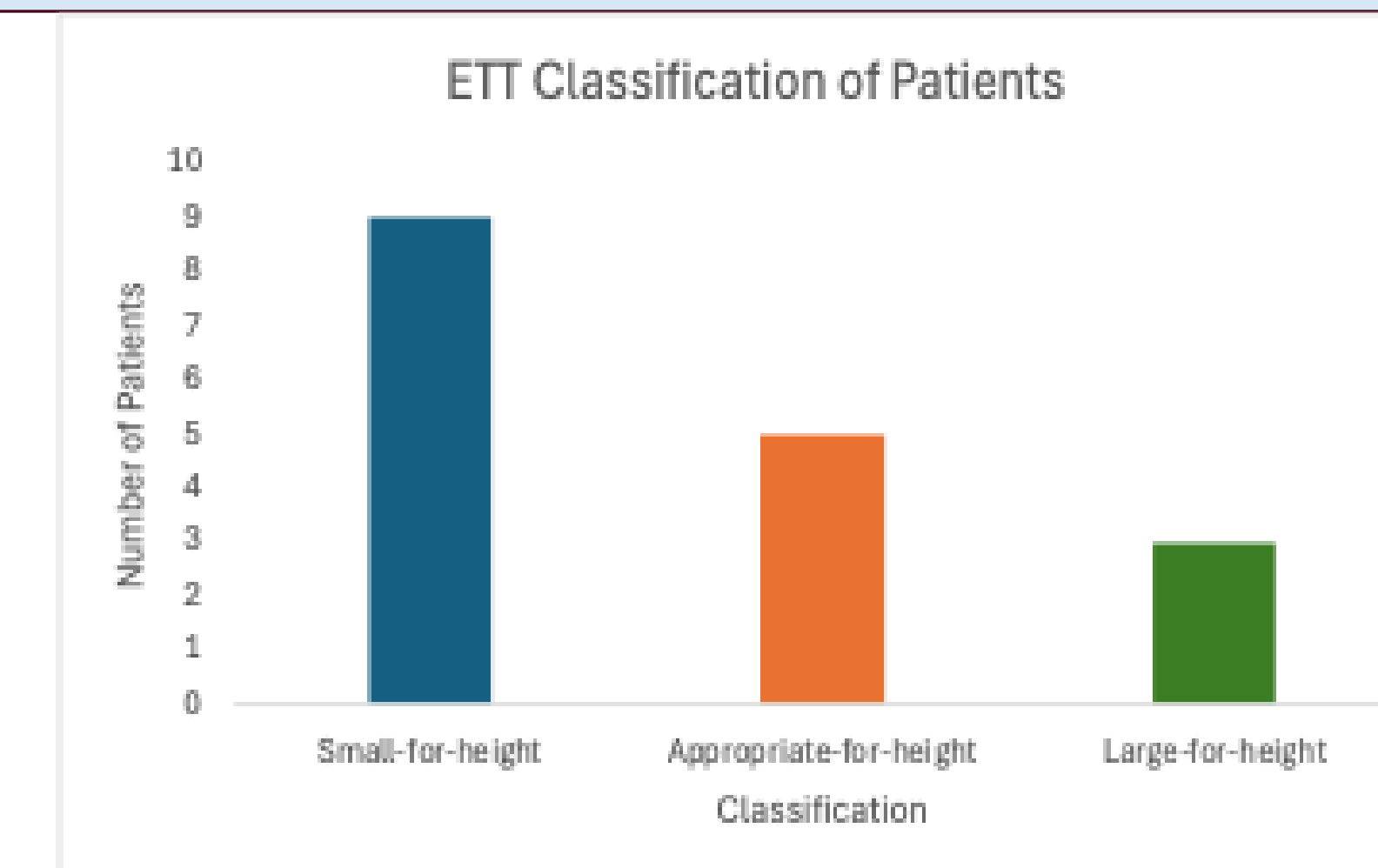


Figure 1. ETT Classification of Patients

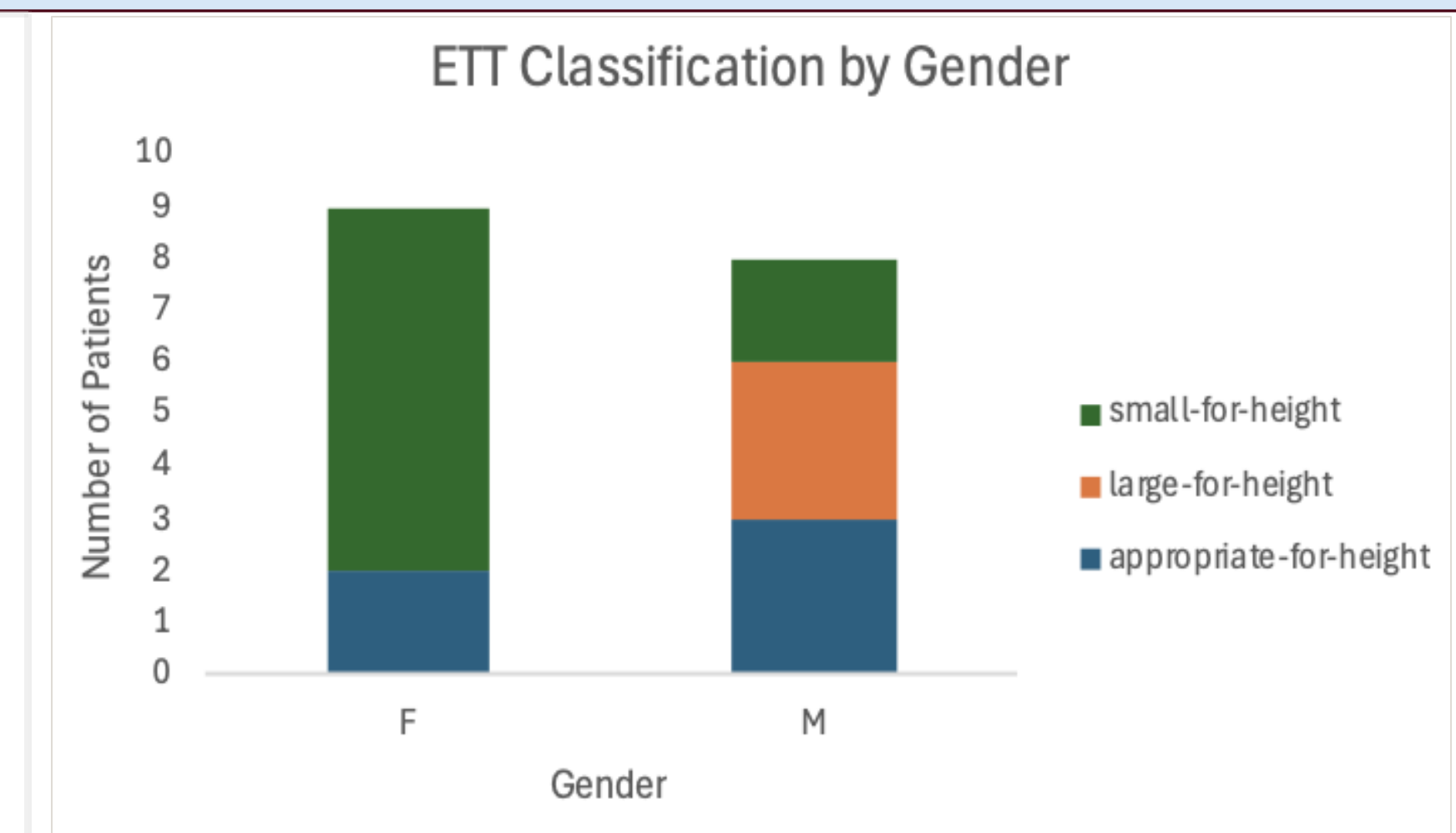
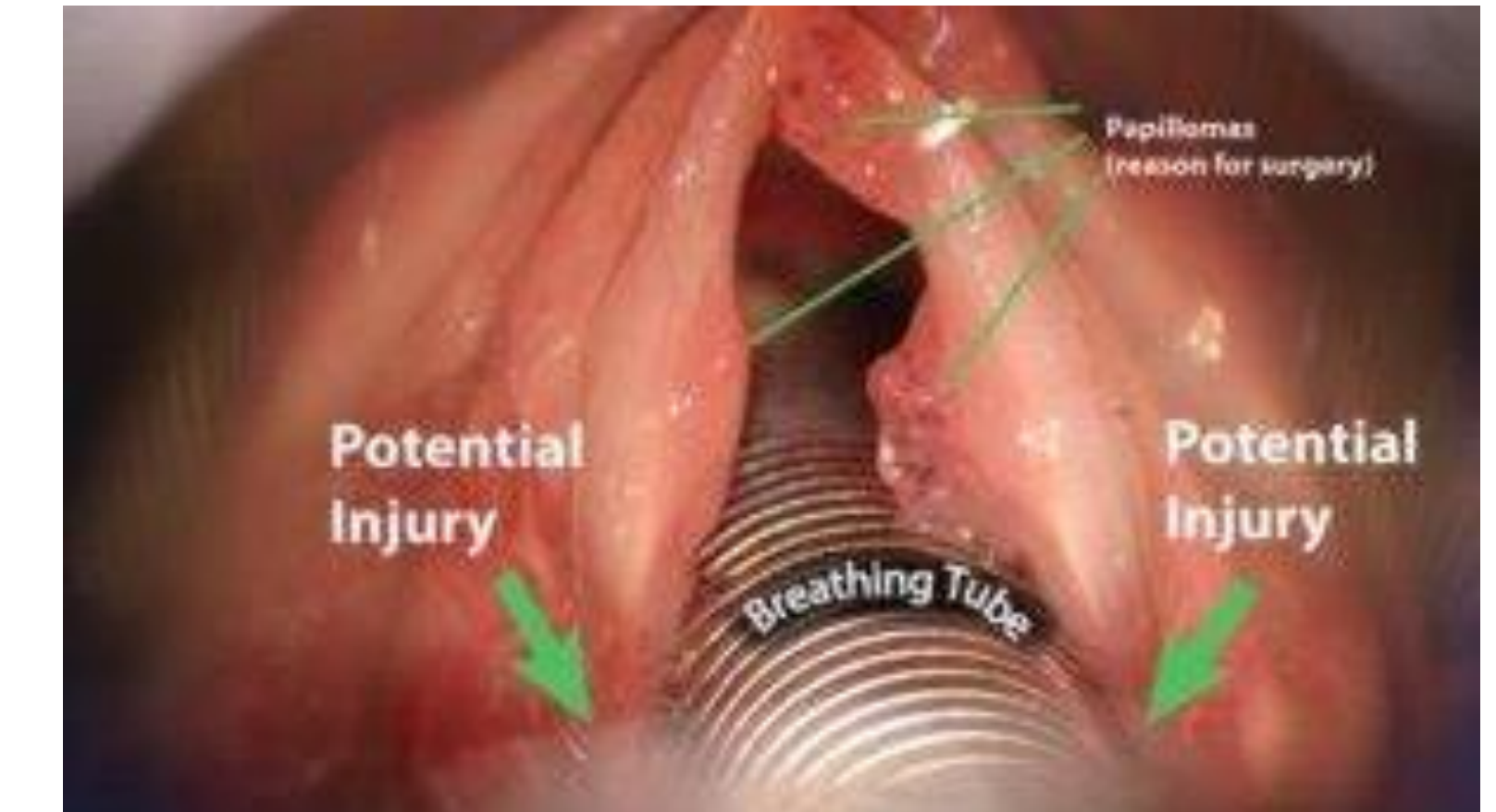


Figure 2. ETT Size vs. Gender



CONCLUSIONS

- Findings highlight a **mismatch between patient height and tube selection practices** despite evidence linking height with tracheal diameter.
- **Females often received smaller tubes** even when height-based guidelines recommended larger sizes.
- Taller patients frequently did not receive appropriately sized ETTs.
- Results emphasize the need for **standardized, patient-specific ETT selection** rather than reliance on generalized norms.

FUTURE DIRECTION

- **Adopt evidence-based sizing methods** to improve accuracy of ETT selection.
- **Develop height- and sex-informed risk tools** to identify patients prone to tube–airway mismatch.
- **Expand to multi-center studies** to validate findings and guide standardized airway management practices.

REFERENCES

