The Adequacy of Emergency Room (ER) and Urgent Care Center (UCC) Radiographs for Pediatric Upper Extremity Injuries

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INTRODUCTION

- Emergency room (ER) and urgent care center (UCC) providers are most commonly the first evaluators of acute pediatric upper extremity injuries, including obtaining radiographs.
- After evaluation of these patients in the ER/UCC, they are referred to hand surgeons for further evaluation, who sometimes need to obtain additional radiographs.
- **Additional radiographs increase the length of the visit, the healthcare costs associated with the injury, and the radiation exposure to the patient.**
- The purpose of this study was to determine the adequacy of the initial radiographs obtained by ER and UCC providers for pediatric upper extremity injuries.

MATERIALS & METHODS

- **Prospective Study:** Patients who presented to the pediatric upper extremity office for injury evaluation after being seen at an outside ER/UCC, during which radiographs were obtained.
- Adequacy of radiiographs determined in a **binary fashion**:
  - **'Adequate':** If no additional images obtained.
  - **'Inadequate**': If the senior resident or attending physician ordered new radiographs.
- Patients who required additional radiographs to assess a potential loss of reduction were excluded from the study.
- The duration of the office visit was recorded for all patients.

RESULTS

- **51 patients enrolled:**
  - **Average number of radiographs obtained by ER/UCC:** 2.9 (SD=0.87).
  - **53% (n=27)** of ER/UCC radiographs were deemed to be **adequate.**
  - **47% (n=24)** were considered **inadequate**.
  - Patients with **inadequate** radiographs required an average of **3.4 (95% CI: 2.7-4.0)** additional images.
- **Most common reasons for repeat radiographs:**
  - **Missing views: (n=8, 33.3%).**
  - **Inadequate lateral view: (n=7, 29.2%).**
  - **Poor image quality: (n=4, 16.7%).**
- Patients with adequate images had a **significantly shorter clinic visit time (p <0.0001)** compared to patients with inadequate radiographs, **with a mean difference of 32.0 minutes (95% CI: 22.4-41.6).**
- Preliminary analysis showed physician assistants took a lower proportion of inadequate images compared to physicians and nurse practitioners.
- **There was a trend in hand/finger radiographs being more adequate.**

DISCUSSION

- **ER/UCC** pediatric upper extremity injury radiographs are often ***insufficient*** to permit the adequate diagnosis and treatment by surgeons.
- Repeat injury radiographs **require longer clinic visits for the patient and family, increase the financial cost to the overall healthcare system, and increases radiation exposure to the patient.**

CONCLUSION

- ER/UCC providers would benefit from **better education** regarding how to optimize radiographs obtained during acute pediatric upper extremity injury evaluations, ***which would lower patient morbidity and healthcare costs.***