**The Use of Camera Mobile Phones in Diagnosis and Management of Hip Fractures**

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Introduction

The act of providing healthcare to a patient when the provider is at a remote location is termed Telehealth. Orthopaedic surgery has joined the ranks of technologic progress by studying different ways to incorporate smartphones into our daily orthopaedic care. In an era of technology, orthopaedic surgeons are becoming dependent on mobile phones to oversee management of patients as they present to the emergency room. The role of mobile devices in staffing orthopaedic consults is poorly studied, even more so in hip fractures. The purpose of this study is to: 1) determine if providers are reliable in diagnosing hip fractures shared across mobile devices, 2) determine if hip fractures consults evaluated in mobile devices lead to higher healthcare costs, 3) determine if hip fractures staffed through mobile devices lead to waste of resources and misinformation given to patients.

Methods:

A set of AP pelvis and Lateral radiographs from ten patients with hip fractures were selected by a senior resident and an attending physician. The images included: 4 intertrochanteric fractures, 2 basicervical fractures, 2 transcervical fractures, and 2 subcapital fractures. A survey was created using the UVA Qualtrics Research Suite. Participants were asked to classify the fractures, ask for additional imaging as needed and state their surgical plan (ORIF vs Arthroplasty). The participants were recruited at the 2019 Virginia Orthopaedic Society Annual Meeting. Participants were ask to complete a mobile survey and a computer survey with PACS accessibility. The mobile survey included the same set of images twice in a randomized fashion to evaluate reliability. The inter- and intra-reader agreement was calculated for the different responses using Qualtrics and Microsoft Excel.

Results

A total of 15 participants were surveyed in the study. Four participants were excluded due to not completing the mobile survey. Eleven participants completed the mobile survey. Five participants completed both the mobile and computer survey. Eight participants were attending physicians, three participants were resident physicians. Six attending physician had fellowship training in: Trauma, Spine, Joints, Pediatrics, or Hand. Two attending physicians were general practitioners. All residents were upper level residents. The intra-reader agreement for classification of hip fractures, management, and need for additional imaging in mobile devices was 78.2% (St. Dev= 13.6%), 90.9% (St Dev=7.8%), and 87.6% (St Dev= 12.4%), respectively. The inter-reader concordance between mobile and PACS for classification of hip fractures, management, and need for additional imaging was 68% (St Dev=20.4%), 88% (St Dev= 13.3%), and 84% (St Dev=18.4%), respectively. Ten participants rated their ability to evaluate images in mobile devices as either comfortable or extremely comfortable; one participant rated it as neutral.

Conclusions

Most of the participants in the study consider themselves comfortable evaluating images in their mobile devices. Intra-reader agreement of 90% is considered as acceptable in epidemiologic studies. This study demonstrate that the use of mobile devices in classifying hip fractures is variable; however, the agreement in managing of these fractures is acceptable when using only mobile devices to evaluate these patients. The use of mobile devices alone may lead to higher healthcare costs by ordering additional imaging. Finally, the inter-rater concordance when using both mobile and computer to evaluate hip fractures showed a high variability in classifying fracture, and a sub-optimal agreement with regards to management. Future steps for this study include adding more participants to improve the validity of these results.