

Assessment of “YouTube” Content for Distal Radius Fracture Immobilization

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OBJECTIVE: Distal radius fractures (DRFs) are the most common orthopedic fractures, with >70% of cases treated by closed immobilization using a short arm cast or a sugar tong splint. However, inadequate immobilization is a risk factor for loss of reduction requiring repeat reduction or surgical treatment. Therefore, education of clinical skills for appropriate immobilization of DRFs is important. With the increasing use of web-based information by medical learners, our aim was to assess the quality and quantity of videos regarding closed immobilization of DRFs on YouTube.

DESIGN: Retrospective review of YouTube videos on distal radius fracture immobilization using specific search terms.

SETTING: Identified videos were analyzed for their educational value, quality of the technical skill demonstrated, and overall metrics. Educational value was scored on a 5-point scale, with “1” indicative of low quality and “5” of high quality.

PARTICIPANTS: Not applicable.

RESULTS: Among the 68,366 videos identified, 16 met our inclusion criteria of being in English; performed by a health care professional or institution; and with casting being the major theme of the educational information provided. Of these 16 videos, 6 had an educational value score of 4 or 5, with the remaining 10 having a score ≤ 3 . Although immobilization was demonstrated by cast technician specialized in orthopedics, skills were also performed by orthopedic attendants, urgent care physicians, orthopedic residents, and nurse practitioners. The credentials of the performer in 3 videos were not identified.

CONCLUSION: There is a need to promote high-quality educational videos produced by established medical school faculty members on open, web-based, portals. (J Surg Ed 1:111-114. © 2017 Association of Program Directors in Surgery. Published by Elsevier Inc. All rights reserved.)

KEY WORDS: distal radius fracture, casting, short arm cast, sugar tong splint, medical education, YouTube

COMPETENCY: Medical Knowledge

INTRODUCTION

Distal radius fractures (DRFs) are the most common of all fractures¹ and are typically treated with closed immobilization, using either a circumferential cast or a sugar tong splint. In the United States and Europe, more than 70% of DRFs were treated nonoperatively between 2005 and 2010.² Inadequate immobilization of these fractures, due to improper molding of the cast or splint and loss of the 3-point fixation, leads to loosening of the cast. The resulting inadequate immobilization is a risk factor for the loss of reduction requiring either repeat reduction or surgical treatment. Therefore, acquisition of the clinical skill of closed immobilization of DRFs is evidently important. In their review of 68 cases of DRF redisplacements in children, Proctor et al.³ reported a redisplacement rate of 5% for DRFs with a perfect reduction, with the rate increasing to 43% for cases with imperfect reduction. This finding was confirmed by several studies reporting a rate of redisplacement of 1% following perfect reduction compared to 17% with an imperfect reduction of a DRF.⁴⁻⁶ The quality of reduction of a DRF entails both reducing the fracture to acceptable alignment parameters such as the volar tilt, radial height, radial inclination, and ulnar variance in addition to applying an adequate short arm cast that will maintain the fracture in that acceptable position. Evaluating a properly applied short arm cast is done mainly through evaluating the molding of the cast, in addition to the casting index, which measures the cast tightness. Information regarding the proper source of education of this skill as an example of orthopedic conservative procedures is lacking.

Use of the World Wide Web for medical education is a great tool to enhance the knowledge and skills of learners, and is an approach which has been used in different fields of medicine.^{2,4,7} In fact, Pretell Mazzini and Rodriguez-Martin⁵ reported that web-based continuous medical

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education was as effective as traditional learning methods. Web-based medical education, also commonly known as e-learning, is part of a learner-centered approach to curriculum delivery that has been adopted by most medical schools and one that offers several benefits. Web-based educational content can be shared across the globe, improving the quality of medical education in regions of the world and, therefore, having the potential to improve health care in these underprivileged regions. YouTube provides a video platform that has been extensively used for patient and public education on health issues as well as for teaching physical examination and clinical skills to health care professionals. However, the quality of the educational content in these videos is not verified in most instances, which creates a potential for delivering misleading information that could result in harm to patients. In the field of orthopedic surgery, no study has been previously published regarding the quality of YouTube videos specifically focused on teaching casting and splinting skills. Therefore, our aim was to identify videos available on the YouTube portal on the closed treatment of DRFs and to evaluate their quality and educational value. This assessment was undertaken with the goal of identifying high-quality videos that could be used as a reference for health care learners.

MATERIALS AND METHODS

Search Methodology

The following terms were used to search the YouTube database: “Below Elbow Cast”, “Below Elbow Slab”, “Wrist Fracture Cast”, “Wrist Fracture Slab”, “Distal Radius Fracture Cast”, “Distal Radius Fracture Slab”, “Short Arm Cast” and “Sugar Tong Splint”. The search was performed independently by 2 investigators (residents at their second year of orthopedic residency) on March 3, 2016. The following inclusion criteria were defined a priori: English language only; clinical skills performed by a health care professional or health institutions; and casting for fracture immobilization was the principal theme of the video. Videos performed by commercial companies promoting their products, videos taken by family/friends of a patient, and videos presented after the 10th page on the YouTube search result pages were excluded from our analysis. Our search approach provides the most informational and educational videos and simulates the resources a real life learner would identify and use. The search terms and results obtained for each are summarized in [Table 1](#). The search results of both investigators were similar.

Assessment of Videos

The content of the videos was assessed by the same 2 orthopedic residents independently, with the educational value of identified videos presented in [Table 2](#). Our method

TABLE 1. Search Terms and Results

Term	Results	Included
Below Elbow Cast	2200	4
Below Elbow Slab	409	1
Distal Radius Fracture Cast	1930	2
Distal Radius Fracture Slab	355	0
Wrist Fracture Cast	27,200	1
Wrist Fracture Slab	766	0
Short Arm Cast	33,100	5
Short Arm Slab	1330	0
Sugar Tong Splint	1066	3
Total	68,366	16

for content assessment was adapted and modified from a previously published study on knee arthrocentesis,⁸ and included the metrics of the video, including author, name of video, duration, upload date, hits, and professional credentials of the performer. The assessment of the technical procedure was based on the AO Reference for short arm casting, which also includes an addendum for sugar tong splinting.⁹ [Table 3](#) demonstrates the 5-point scoring system used to evaluate the educational content and quality of the technical demonstration presented in the video. Discrepancy between scoring obtained by the 2 independent investigators was resolved by consensus after a second review of the videos, with the assistance of the senior author (attending orthopedic trauma staff).

Statistical Analysis

Statistical analysis was performed using SPSS Software (IBM Corp. Released 2015. IBM SPSS Statistics for Macintosh, Version 23.0., Armonk, NY: IBM Corp). We used simple descriptive statistics to present our analysis.

RESULTS

Search Terms and Outcomes

Our search strategy identified 68,366 videos, of which only 16 met our inclusion/exclusion criteria. Of the 16 videos retained for analysis, skills for below elbow circumferential casting were identified in 10 videos and sugar tong splinting in 6 videos. Outcomes of our assessment of the educational

TABLE 2. Educational Content Assessment Criteria

1	Imaging obtained
2	Analgesia mentioned
3	Neurovascular examination
4	Traction during application of cast/splint
5	Borders of splint/cast defined
6	Molding of cast/splint
7	Ulnar deviation and volar flexion of the cast/splint
8	Complications mentioned

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