

Scalp laceration repair with hair apposition technique in the maritime environment under telemedicine guidance using free open-access medical resources

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ABSTRACT

Requests for medical advice to evaluate injuries sustained on board a shipping vessel make up a significant number of calls to Telemedical Maritime Assistance Services. As the maritime setting is an austere environment with regards to resources such as equipment and availability of medically trained personnel, it is important to have a set of skills and techniques to treat all manner of common injuries with the tools at hand. Here we discuss a case report of using telemedicine and free open-access medical education resources to teach the hair apposition technique to an on-board medical provider for the treatment of a scalp laceration with good outcome.

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Key words: telemedicine, maritime, hair apposition technique

INTRODUCTION

Evaluating and treating injuries at sea comes with a unique set of challenges, including finite resources, varying levels of medical training for providers on board, and communication limitations with expert providers ashore. Additionally, definitive care for injuries may be days or weeks away. Delaying injury care may be detrimental to the injured, including in situations where prompt laceration closure is required. Delayed laceration repair can lead to increased bleeding and pain, wound infection, and poor cosmetic outcomes. Additionally, diverting or evacuating and repatriating an ill mariner can carry significant cost [1]. Telemedical Maritime Assistance Services provide an avenue for shipboard crew to seek out medical advice from shore-based expert medical providers, who can communicate medical advice to onboard crew and assist with decisions about treating on board or evacuating the mariner.

The incidence of emergency department visits for wounds or lacerations has been estimated to be about

12 million visits per year [2]. It is difficult to estimate the incidence of these injuries at sea due to multiple factors, including a heavily rotating workforce, assumed underreporting of injuries, and varying standards of diagnosis and care.

Case series estimate that between 17% and 32% of all maritime telemedicine calls are for injury evaluation [3, 4]. Management of these injuries is complicated by wide variations in available medical equipment on ships and by crew difficulty maintaining procedural skills to a sufficient level to treat. Improvisation and re-purposing of equipment can be used to make up for equipment shortfalls, and pictures, written material, instruction, and on-line video (when bandwidth permits) may be used to make up for procedural skill shortfalls.

We describe a case for which email-only, or asynchronous telemedicine was used in conjunction with a free open-access medical (FOAM) education resource to instruct crew at-sea on the use of the hair apposition technique (HAT) in scalp laceration repair for an injury sustained at sea.



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Figure 1. Laceration at the time of consult



Figure 2. Laceration at the time of repair

CASE REPORT

A 32-year-old male crewmember on a small cruise ship sustained a head laceration (Fig. 1) approximately 5 cm long when a pot lid fell on his head. A telemedicine consult was made approximately 12 hours after the initial injury. There was no loss of consciousness, neck pain, or neurological deficit. Bleeding was controlled by the time of the initial consultation. The ship was 1–2 days from port. The vessel was carrying a commercially available medical kit which had supplies for wound care, including cleaning supplies, dressings, and skin closure strips. The kit did not contain sutures, skin glue, or skin staples.

After understanding the mechanism of injury and gathering information to complete a brief neurological exam, the consulting physician suggested copious irrigation and closure using the hair apposition technique to close the wound. A FOAM resource was shared with the ship's medical officer, who completed wound closure using the technique [5]. The medical officer used a commercial super-glue to complete the technique because the ship did not carry a medical adhesive.

Follow-up photos were obtained immediately after closure (Fig. 2) and at 10 days (Fig. 3). The wound healed well and there were no complications.

DISCUSSION

Lacerations are an extremely frequent injury leading people to seek out emergency care. In the outdoors recreational setting, lacerations account for approximately 14,800 out of every 100,000 injuries, and lead to approximately 12 million emergency department visits per year [2, 6].



Figure 3. Laceration after 10 days

The high frequency of injuries occurring in the austere environment highlights the importance of disseminating appropriate information for the proper treatment of scalp lacerations. The case highlighted above took place on a small cruise ship far from port with limited equipment and expertise to carry out the repair. The hair apposition technique was suggested due to its simplicity and minimal equipment requirement.

The technique has been studied for use in multiple settings, including the emergency department [2, 7–11], austere environments [6, 12], and by different types of healthcare providers [10], overall noting non-inferiority, if not

superiority as compared to typical wound closure techniques such as suture, staples, or tissue adhesives. The technique is easy to teach in less than a half hour [8, 10] and had similar outcomes between emergency department physicians and nurses [10]. HAT is inexpensive to perform, requires little more than the skill of the practitioner and the use of an appropriate adhesive, and does not require painful removal of wound closure equipment left in situ, such as sutures or staples, nor the injection of a local anaesthetic [8, 9]. Variations exist for HAT, including the modified HAT developed in Turkey, which utilises surgical instruments to bundle and secure hair to bring a scalp laceration together [7]. The technique was used in this case with a satisfactory outcome and with no complications.

As no video was available to directly and synchronously guide the ship's medical officer, FOAM literature was distributed, along with verbal instructions to treat this injury. FOAM resources entail "a collection of interactive online medical education resources – free and accessible to students, physicians, and other learners" [13]. FOAM uses social media, podcasts, tweets, and other web-based resources to allow dissemination and deliberation of emerging scientific and medical research [14]. In the FOAM paradigm, these resources have been used by members of the medical community as a tool to share rapidly emerging concepts [15].

Those who provide care in austere environments or on a part-time basis may need to treat injuries or illnesses that were not directly covered over the course of their medical training. Free open-access medical education can be a great boon to medical and health professions students as well as those practicing in the austere environment (including critical access hospitals, rural settings and low resource settings), who may need to infrequently call on a broad breadth and depth in medical skills across many fields.

In this case a FOAM resource was used in a novel way to allow an experienced physician to assist a ship's medical officer, who had limited experience, to properly treat an injury. Scalp lacerations have a wide range of undesirable outcomes, such as scar formation, poor cosmesis, and infection, hence it is important that they be promptly and definitively repaired and treated. Layperson use of FOAM resources to treat injury in a resource-limited austere setting, with vetting and guidance from an experienced physician, may be an emerging future use as FOAM matures.

CONCLUSIONS

In individuals with an appropriate amount of hair, scalp lacerations in a variety of settings, including the austere environment, can be appropriately managed with minimal equipment and training using the hair apposition technique.

FOAM can serve as a source of easily available and sharable content for medical providers in austere locations to be used under the guidance of a telemedicine physician.

Conflict of interest: None declared

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