A serious injury underlying an underestimated small laceration of the hand

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ABSTRACT

In patients suffering from hand injuries, the most important diagnostic tools include patient history and physical examinations. Injuries of the hand caused by knives or drilling tools require careful attention because serious injuries can occur in the form of small skin incisions, depending on the distance and depth of the advance of the tool. Because stab wounds can appear minor superficially, whereas serious injuries can appear as small-access lacerations, the examining physician should be careful when evaluating wound severity. Here, we present a patient with an injury from a knife attack who was treated with an initial intervention that was insufficient to completely repair the injury. Upon initial examination, the only obvious sign of injury was a small laceration; however, the injury turned out to be much more serious in nature.

Key words: Hand injury, laceration, physical examination, flexor tendon

Introduction

The hand is one of the most common body parts that is affected by knife injuries [1]. During an assault, the victim usually incurs damage to the hand, but the attacker can also incur hand injuries, although rarely [2]. In the victim, the flexor surfaces are often injured due to the attacker pulling the knife while the victim is holding the knife blade in an attempt to resist the attack. The damage can vary from a simple skin incision to complex injuries affecting the bone.

The site of physical examination of hand injuries caused by cutting (for example, with a knife or drilling tools) is critical. The area on the hands where these tools come in contact with, the length of the tools, with the vector moving along, and the characteristics of the tools (i.e., whether they are flat or curved, or have sharp edges on one or both sides), also affect the severity and type of injury. Serious injuries can occur in the form of small skin incisions, depending on the distance and depth of the advance of the tool [3]. Like pressure sores, they have been compared to an iceberg, appearing small on the surface but hiding a huge mass underneath. For these reasons, detailed information on the history of the patient admitted with a hand in-
jury resulting from a knife should be obtained and a thorough physical examination should be performed. Finger movements, blood circulation, and innervation must be evaluated individually. Treatment should be planned according to the extent of damage detected.

In this article, we present a patient injured from a knife attack who was initially treated with an intervention that was insufficient to completely repair the injury. Therefore, 1 month after incurring the injury, the patient was admitted to our clinic because of symptoms of limitations in finger movement.

**Case Report**

A 37-year-old man was admitted to an institution because of an injury to his left hand that resulted from a knife attack. Upon hospital admission, finger movement limitations were also present in addition to a hand laceration. Based on the evaluation, the lacerated area was primarily repaired in the emergency department, and the patient was followed up in the plastic surgery clinic of the same institution. During follow-up examinations, the patient reported being unable to flex his fingers. Hence, a physical therapy consultation was requested because the clinical manifestations of the patient were not consistent with the injury. The patient received physical therapy for a period of 1 month but did not benefit from the treatment. On ultrasonography (USG), the tendons were found to be intact. The patient was admitted to our clinic because of continued loss of function.

A 2-cm laceration scar extending vertically from the lateral aspect of the fifth metacarpal of the left hand was found on physical examination. The patient was unable to flex his second, third, fourth, and fifth fingers at both the distal and proximal interphalangeal joints. Hypoesthesia was present in the fourth and fifth fingers. Although the result of the physical examination of the patient was consistent with damage to the superficial and deep tendons of the second, third, fourth, and fifth fingers, magnetic resonance imaging (MRI) examination, which is a more advanced imaging method, was requested, as these structures were reported as being intact in the USG report. The MRI revealed that the superficial and deep flexor tendons of the second, third, fourth, and fifth fingers were cut (Figure 1). An intra-
operative evaluation revealed that the common digital nerves and arteries of the fourth and fifth fingers were cut, along with the flexor tendons (Figures 2 and 3). The tendons were repaired with 3/0 braided polyester suture by using the modified Kessler technique, and the nerves were repaired by using 10/0 polypropylene suture. The patient was discharged from our clinic without any postoperative complications.

**Discussion**

Presently, cases of stab wound injuries are increasing as a result of the increase in violence. Both the attacker and victim can incur injuries from the weapon used during the assault [4]. The types of injuries suffered by the victims often vary with their positions taken while trying to protect themselves. Thoracic and abdominal regions are often injured [2]. The victim’s hand can also be damaged while protecting oneself from the attack.

Often, incisions occur in the fingers and palmar aspects of both hands as a result of trying to grab the weapon. These injuries vary from simple skin incisions to finger or hand amputations. Usually, the patient is admitted to the hospital with a simple skin incision. Injuries of the tendon, nerve, and artery are rare [5]. In addition, injuries can occur on the ulnar side of the hand as a result of the position taken for protection [2].

Structures that can be damaged are often taken into consideration when assessing the area of injury, and an examination is performed accordingly. Although the injury may be observed as a simple skin incision at first sight, damage to numerous subcutaneous structures may also be found. Serious hand injuries can occur as small skin incisions, which are determined by the structure of the weapon used [3]. A patient admitted to the hospital with such an injury can present with clinical manifestations that may be considered inconsistent with the incision observed. The physician who performs the examinations may ignore the underlying serious injuries as a result of prejudice against, and mistrust of, the people involved in the criminal events [6]. In the present case, only a 2-cm long vertical incision scar was present in the ulnar lateral aspect of the fifth metacarpal of the patient’s hand. Externally, this incision appeared to be unrelated to the palmar region through which the flexor tendons pass. Therefore, the physician who performed the first intervention might not have been suspicious of a flexor injury. However, failure to make a diagnosis at follow-up examinations may be due to failure to obtain information on the patient’s history, which is essential in hand injury cases, failure to perform sufficient physical examinations, and/or failure to determine the complexity of the case. In addition, an inability to anticipate that cutting and drilling tools can lead to deep wounds may result from a lack of experience of the physician.

The repair of undetected damage is therefore delayed as a result of an insufficient examination. Satisfactory results are achieved when tendons are repaired without delay [7]. However, the longer the delay, the more difficult the repair becomes, as more extensive surgery may be needed [8]. Rehabilitation after repair also becomes more difficult. In the worst-case scenario, a permanent loss of hand function may occur.

If the clinical examination results are not consistent with the history of the patient, or if the results arouse suspicion, then a referral is necessary for further evaluation [9]. The most useful examination tool is MRI, which is also the most valuable imaging tool to use for the diagnosis of soft tissue pathologies [10]. Pathologies definitively diagnosed via MRI are treated with the necessary surgical or conservative methods. In the present case, radiological imaging methods were used and USG was implemented first. However, the cut structures were reported as normal. USG has been shown to be reliable in the diagnosis and management of flexor tendon injuries [11]. The false-negative USG imaging result obtained in our patient may be due to a failure of proper coordination between the physician performing USG, which is a practitioner-dependent method, and the physician requesting the imaging method, but may also be due to an assessment of the structures at a level different from the incision level. Moreover, in this case, the final diagnosis was made via MRI.

As stab wounds can appear minor superficially and serious injuries can appear as small-access lacerations, the examining physician should be careful in this regard. If the observations upon inspection are not consistent with the examination results, then further investigations are required.
Conflict of interest statement
The authors have no conflicts of interest to declare.

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