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CASE REPORT

Surgical Innovation: A New Technique to Avoid False Incisions in Modified Henry's Approach for Distal Radius Fractures

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ABSTRACT

This study presents a novel technique employing fluoroscopy and K wire to accurately locate the Flexor Carpi Radialis (FCR) tendon during the modified Henry's approach for distal radius fracture fixation. Conventional palpation methods can be unreliable, especially in cases of swelling, potentially leading to false incisions that endanger surrounding structures such as the radial artery and median nerve. Our method identified consistent radiological landmarks the waist of the scaphoid and medial one-third of the base of the second metacarpal allowing for precise incision placement in fifty clinically tested patients. This technique enhances the safety and efficacy of the modified Henry's approach, providing valuable guidance for novice surgeons.

KEYWORDS

• Distal Radius Fractures • Modified Henrys Approach • Fluoroscopy • Radiological Landmarks.

INTRODUCTION

The modified henry's approach[1] is widely used for exposure of the volar distal radius for fracture fixation[2]. The approach relies on developing a plane between FCR and Radial artery, following which the FPL muscle is retracted medially, and Pronator quadratus is elevated from its attachment on the distal radius, thus exposing the bone.[3]

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The accurate location of the FCR tendon[4,5] is critical for this approach, and this may prove troublesome for novice surgeons, particularly when swelling can obscure the usual landmarks used to locate this tendon. The tendon is usually palpable just medial to the radial artery, whose pulsations can be felt in the wrist region. However, the arterial pulsations may not be palpable due to high swelling and/or the use of tourniquet.

Further, the presence of the palpable palmaris longus tendon in this region can mislead the beginner and cause him to make a false incision over the Palmaris Longus, thereby putting the median nerve at risk of damage.

A false lateral incision made over the radial artery can injure this vessel. A false medial incision over the palmaris longus and subsequent dissection can put the median nerve at risk.

Thus, we felt the need to describe an additional technique using fluoroscopy[6] to eliminate the possibility of false incisions, and to make a perfect incision just radial to the FCR.

METHODS

1. **Step 1:** Identifying the radiological landmarks under fluoroscopy.

   This step was performed after routine fracture fixation in fifty patients with distal end radius fractures. Prior to their skin closure, a K wire was placed directly on their FCR tendons, and an Antero-posterior fluoroscopic Figure was taken, as shown in the Figures below.

Figure 1: Placing K wire directly on exposed FCR tendon

Figure 2: Anteroposterior Fluoroscopy Figure

It was noted that the K wires were consistently located over two landmarks – the waist of scaphoid, and the medial 1/3 of the base of 2nd Metacarpal.

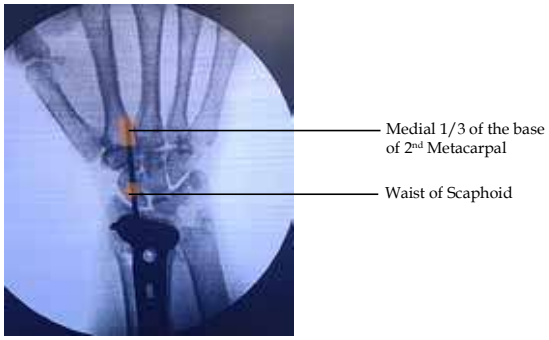

Figure 3: Identifying the radiological landmarks

The wounds were then closed routinely.

Step 2: Using the radiological landmarks to locate the FCR tendon in fresh patients.

Under fluoroscopic guidance, a k wire was placed over the wrist, directly overlying the two previously identified landmarks (waist of scaphoid and medial 1/3 of 2nd MC base).

Figure 4: K wire placed over wrist

Figure 5: Anteroposterior Fluoroscopic Figure, K wire is aligned with previously identified landmarks (waist of scaphoid and medial 1/3 of base of 2nd Metacarpal)

The incision site was then marked just radial to the K wire, over the distal forearm and wrist. Incision was then made. It was noted that the FCR tendon was under the marked incision.

Figure 6: FCR tendon located directly under the marked incision

This step was repeated for fifty patients, and in all cases, the FCR was successfully located. The subsequent dissection and other procedures were uneventful.

RESULTS

The usage of radiological landmarks (Waist of scaphoid and medial 1/3 of base of 2nd Metacarpal) seems to be a viable method to locate the FCR tendon.

DISCUSSION

The FCR muscle takes origin from the medial epicondyle of Humerus.[7] It runs just laterally to flexor digitorum superficialis and inserts on the anterior aspect of the base of the second metacarpal, and has small slips to both the third metacarpal and trapezium tuberosity. In its course, the FCR also uses the scaphoid tuberosity as a pulley, and is said to be a dynamic stabilizer of scaphoid.[8]

Based on these anatomical features, it becomes clear that the FCR is in close proximity to the scaphoid and the 2nd metacarpal base.[9,10] A possibility of using these bones as radiological landmarks to locate the FCR thus emerged. Subsequently, we attempted a method to better define these landmarks using a K wire and Fluoroscopy.

The conventional palpation method to locate the FCR tendon may not always work for the beginner surgeon. As mentioned earlier, false incisions over the radial artery or the PL tendon may put the artery or the median nerve at risk.

Our newly described method provides an additional confirmation of the accuracy of our planned incision. The FCR was successfully located in all the patients in whom we tested this method.

We believe that this method will provide additional confidence to the beginner surgeon as he attempts the modified Henry approach.

CONCLUSION

It is possible to locate the FCR tendon using radiological landmarks, through the aid of K wire and fluoroscopy.

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