Flucloxacillin Reduces Stiffness Following Flexor Tendon Repair

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Abstract To determine the benefit of antibiotic prophylaxis on postoperative mobility in flexor tendon repairs, case notes of 72 flexor tendon injuries in twenty four patients were analyzed retrospectively (2001–2003). Only patients with non-contaminated injuries from sharp instruments in flexor zone 2 were included in the study; 57% were male, average age was 31 years, and 24% were smokers. The majority of injuries were caused by metal blades (45%). Most tendons were repaired with modified Kessler technique (69%). Twenty-five percent received intravenous flucloxacillin or co-amoxiclav perioperatively. Reduced total active motion (TAM, found in 25% of patients more than 7weeks after surgical repair) significantly complicated patients without perioperative intravenous flucloxacillin cover. The use of intravenous perioperative flucloxacillin is a plausible adjunct in surgery to prevent postoperatively reduced mobility.

Keywords Flexor · Tendon · Mobility · Stiffness · Flucloxacillin · Antibiotic prophylaxis

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Introduction

The most common complications after flexor tendon repair are rupture, joint contracture, and tendon adherence [13].

Risk factors for reduced mobility are digital joint flexion contractures and adhesions that resist tendon gliding and ultimately necessitate tenolysis. The surgical technique plays an important role in preventing stiffness [12], but equally important is the postoperative rehabilitation program [2–5]. Age tends to be a negative prognostic factor.

Infective flexor tenosynovitis can lead to stiffness. Platt and Page reduced hand infections with perioperative antibiotics [9]. Stone and Davidson, however, found no use for them in reducing infections in flexor tendon injuries [11].

The aim of the present study is to evaluate the role of antibiotics in prevention of clinical or subclinical infection which could result in reduced mobility.

Patients and Methods

A retrospective cohort study was performed on trauma-patients with flexor tendon surgery in the years 2001–2003. Cases were identified from the surgical hospital database. Included were cases with non-contaminated sharp divisions of flexor tendons in zone 2. Excluded were cases with insufficient information in their records and those who had less than 7weeks follow-up or did not comply with the postoperative rehabilitation protocol. Cases with total active motion (TAM) of less than 75% of the corresponding contralateral digit [6] after 7weeks were documented as having postoperative stiffness.

Continuous data in this study were analyzed, using two-tailed *t* tests with or without transformation to normal distribution. Categorical data were analyzed using χ^2 tests

or *F* tests if criteria for estimated sample sizes were not met. Possible confounding factors such as age or surgical delay were analyzed using *t* test and found to be evenly distributed among hands with and without reduced postoperative motion (Fig. 3)

Results

A total of 72 flexor tendon injuries in 24 patients with an average follow-up of 156 days were finally evaluated.

Fifty-seven percent were male; the average age was 31 years. Twenty-four percent of patients were smokers. Accidents happened at home in 68%, followed by work accidents in 18%. Hospital stay was 2 days in average.

Twenty-five percent of patients had intravenous antibiotic cover perioperatively with co-amoxiclav (12.5%) or flucloxacillin (12.5%), typically 1 g in either case given at induction. Most injuries were repaired using modified Kessler repair (69%). The decision to give antibiotics depended on personal preference rather than on clinical scenario.

In all cases, a dorsal blocking splint was applied postoperatively, keeping the wrist in slight flexion and the metacarpophalangeal and interphalangeal joints in the position of safety.

The postoperative rehabilitation protocol consisted of early active motion starting within the first 48 hours after repair. All cases complied with the hand therapy regime.

Reduced mobility with less than 75% TAM of the corresponding contralateral digit was noted in 18 cases (25%) after more than 7 weeks after surgery. Two ruptures were also documented (Fig. 1).

None of the patients who had received intravenous flucloxacillin and only two out of 10 patients on intravenous co-amoxiclav had postoperatively reduced TAM, a difference which proved significant ($p < 0.05$) when

Figure 1 Complications after tendon repair.

Figure 2 Intravenous antibiotics and reduced mobility.

comparing intravenous flucloxacillin in stiff versus uncomplicated hands (Fig. 2).

Discussion

As early as 1976 Marshall et al. could demonstrate that traumatic hand injuries carried only an insignificant level of bacterial contamination and were comparable to those of elective cases [7]. Bongartz et al. found bacterial contamination in 84% of all hand injury smears, but only 4% became infected. They concluded that debridement and conscientious wound control rather than antibiotics were key points to minimize infection [1]. Swanson, Platt and Page noticed an increased infection rate in contaminated hand wounds, responsive to antibiotics [9, 14]. Intravenous flucloxacillin appeared to reduce the rate of postoperative stiffness at a very significant level in this study. *Staphylococcus* species are the most common organisms found on the skin of the hand [8, 10]. Platt and Page managed to reduce the infection rate in hand injuries with perioperative antibiotics [9]. In our study, no case of infection was documented and of the cases who had received intravenous flucloxacillin none developed stiffness. No infections developed postoperatively in our

Figure 3 Insignificant influence of potential confounding factors.

sample. A significantly lower rate of stiffness could be found in cases with intravenous flucloxacillin. A review of the data did not suggest a significant influence of potential confounding factors such as a difference in the postoperative rehabilitation, a higher age, or surgical delay (Fig. 3).

This study is, however, limited by the number of tendon injuries and the restrictions, which come with a retrospective study. Further prospective studies in individuals with comparable clinical scenarios and randomized allocation to different antibiotic regimes might yield more information about this subject.

As infective flexor tenosynovitis can be complicated by stiff hands, the preventative potential of antibiotics appears plausible.

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