

Comparing wound complication rates following closure of hip wounds with metallic skin staples or subcuticular vicryl suture: A prospective randomised trial

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ABSTRACT

Purpose. To compare 2 methods of wound closure—metallic staples or 3-0 undyed vicryl—according to postoperative wound complication rates.

Methods. Patients who underwent surgery for proximal femoral fractures were randomised to have wound closure with metallic staples or with subcuticular vicryl suture. Wounds were regularly examined postoperatively and only those with positive wound swabs were regarded as wound infections.

Results. Five infections and one superficial wound dehiscence occurred in the patients who had wound closure with metallic staples. The complication rate was significantly higher for this group compared with the group who had wound closure with subcuticular vicryl suture ($p < 0.025$).

Conclusion. Superficial wound complication rates

are higher for wounds closed with metallic staples compared to wounds closed with subcuticular vicryl.

Key words: femoral neck fractures; surgical wound infection; suture techniques

INTRODUCTION

The aim of closure of a surgical wound is to promote rapid healing by opposition of skin edges to leave a cosmetically acceptable scar. The technique should be watertight, tension free, and should be achieved without inverting the skin edges. Delayed wound healing—especially in elderly patients undergoing surgery for proximal femoral fractures—can prolong recovery, may progress to deep wound infection, can increase morbidity and mortality, and has cost implications.¹ The aim of this study was to determine

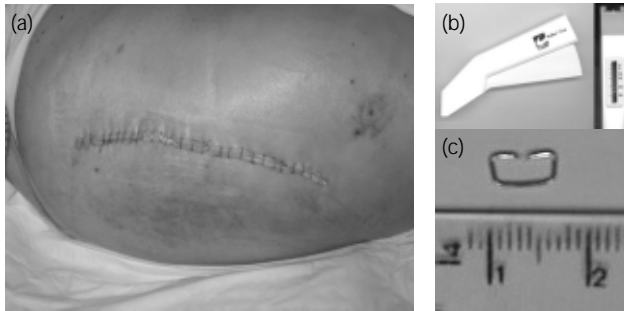


Figure 1 Hip wound closed with metallic staples: (a) hip wound at day 5 postoperatively, (b) Reflex One staple applicator, and (c) 6.9-mm wide staple.

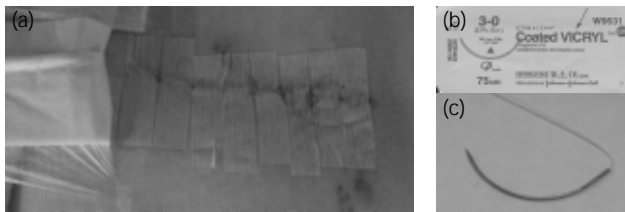


Figure 2 Hip wound closed with 3-0 subcuticular undyed vicryl suture and steri-strips: (a) hip wound at day 5 postoperatively covered partially with opsite dressing, (b) 3-0 vicryl suture, and (c) cutting needle.

if there was a difference in superficial wound complication rates between 2 methods of wound closure—metallic staples or subcuticular vicryl suture.

MATERIALS AND METHODS

A pilot study was conducted between December 1998 and March 1999 for patients admitted to the Kent and Sussex Hospital with proximal femoral fractures that required treatment with cemented hemiarthroplasty, dynamic hip screw, or cannulated hip screws (Asnis; Stryker, Howmedica Osteonics, Mahwah [NJ], US). The study was subsequently extended from December 1999 to March 2000 because preliminary results showed higher incidence of complications in wound closure using metallic staples.

Patients were randomised into 2 groups with respect to wound closure. A sealed envelope method was used. The surgeon was not aware of the method of closure to be used until the subcutaneous fat was closed. The 2 methods of closure were metallic skin staples (Reflex, Delasco [IA], US) of 6.9 mm wide (Fig. 1), or 3-0 subcuticular undyed vicryl suture (Ethicon, Edinburgh, UK) with steri-strips (Fig. 2).

Table 1
Age and sex distribution of patients (n=101)

	Group A (staples)	Group B (vicryl suture)
No. of patients	54	47
Mean age (range)[years]	83.5 (62–98)	81.7 (53–99)
Male:female	13:41	7:40

Table 2
Closure method and complication rate according to the seniority of surgeon

Seniority of surgeon	Metallic staples (no. of complications)	Vicryl suture	Total
Consultant	2	2	4
Specialist	14	13	27
Registrar	26 (4)	23	49
Senior house officer	12 (2)	9	21
Total	54	47	101

110 patients were initially randomised and included in this study. Nine patients died in the immediate postoperative period, leaving 101 patients in the study. Of these 101 patients, 54 patients had wounds closed with staples (group A), 47 patients had wounds closed with subcuticular vicryl sutures and steri-strips (group B). The age and sex distribution of the 2 groups was similar (Table 1). The seniority of the surgeon and the method of closure used are shown in Table 2.

Wounds were covered with an opsite dressing and a pressure dressing. Wounds were viewed on the ward on day 5 and day 10 postoperatively. A microbiology swab was taken if there was a discharge from the wound. Only positive swabs were counted as a wound infection. The patient would then be treated with antibiotics. Skin staples or steri-strips were removed on day 10 postoperatively. 67 patients received chemical deep vein thrombosis prophylaxis (34 in group A and 33 in group B). Risk factors for complications, such as diabetes mellitus, steroid intake, and other systemic diseases were noted.

RESULTS

There were no superficial wound infections in group B (vicryl suture), whereas 5 wound infections and one wound dehiscence were recorded in group A (staples), giving a complication rate of 11%. This difference in complication rates between groups was statistically

significant ($p < 0.025$). All complications occurred in female patients. *Staphylococcus* was grown in 2 cases, mixed anaerobes in one, *Enterococcus* in one, and coagulase-negative *Staphylococcus* in one. All infected wounds responded to oral antibiotics. Three of the patients with wound complications received chemical deep vein thrombosis prophylaxis. There were no systemic risk factors noted in any of the patients with wound complications. Secondary closure was performed using subcuticular vicryl suture for the patient with wound dehiscence. Hospital stay was prolonged in all patients with wound complications.

DISCUSSION

Hip fractures have a huge impact on patients, and also on the resources of health-care service. Surgical treatments that minimise hospital stay and reduce morbidity are usually advocated. If postoperative complications occur, hospital stay is prolonged, and the patient has a higher risk of morbidity and mortality.^{2,3} All attempts should therefore be made to

reduce the risk of complications following surgical treatment.

Our study has shown a statistically significant increase in the risk of complications, mainly infection, with wound closure using staples. Metallic staples are 5 to 10 times more expensive than vicryl sutures. Increased in-patient stay because of wound complications also increases the cost of treatment.⁴ In addition, removal of metallic staples can be uncomfortable for patients.⁵⁻⁷ Nonetheless, wound closure with subcuticular vicryl suture requires a slightly longer operative time than wound closure with staples.⁸

CONCLUSION

This study found a significantly higher incidence of superficial wound infection following surgical treatment for hip fracture when wound closure was performed using metallic staples. Hence, using subcuticular vicryl suture for wound closure is a preferable method.

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