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Absorbable or non-absorbable sutures? A prospective, randomised evaluation of aesthetic outcomes in patients undergoing elective day-case hand and wrist surgery

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ABSTRACT

INTRODUCTION We prospectively evaluated aesthetic outcomes in a group of randomised patients who underwent elective day-case hand and wrist surgery using either absorbable or non-absorbable sutures.

PATIENTS AND METHODS A cohort of 100 adult patients were randomised using sealed envelopes to receive either absorbable or non-absorbable sutures for their wound closure. Clinical review was carried out at 6 weeks. A postal questionnaire was sent to all patients 3 months following surgery comprising a visual analogue scale (VAS) for wound satisfaction, a validated 6-point patient scar assessment tool and the shortened version of the disabilities of the arm, shoulder and hand questionnaire (QuickDASH).

RESULTS From the postal questionnaire, 70 responses were received. There was no statistically significant difference between the two groups in terms of VAS, patient scar assessment tool and quick DASH.

CONCLUSIONS For elective day-case hand and wrist surgery, either suture material can be used confidently with respect to overall aesthetic appearance in such patients.

KEYWORDS
Absorbable suture – Non-absorbable suture – Aesthetic – Hand surgery

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A major determinant of patient satisfaction following surgery to the upper limb is an acceptable cosmetic result.[1] Both absorbable and non-absorbable suture materials are available for wound closure. Absorbable sutures do not require removal and may, therefore, save clinic time and reduce patient anxiety postoperatively. Non-absorbable sutures may be less likely to elicit an inflammatory response or break prematurely. The aim of this study was to evaluate prospectively aesthetic outcomes in a group of randomised patients undergoing elective day-case hand and wrist surgery using either absorbable or non-absorbable sutures.

Patients and Methods

One hundred adult patients presenting to our unit for day-case hand and wrist surgery were included in the study. Patients on steroids or those who had medical problems affecting wound healing (such as diabetes mellitus) were excluded as were those undergoing revision procedures. All patients were under the care of a single consultant hand surgeon who routinely utilised both absorbable and non-absorbable wound closure for upper limb surgery. Following informed consent, patients were randomised using a sealed envelope technique to receive either absorbable (3/0 Vicryl rapide™, Ethicon, UK) or non-absorbable sutures (3/0 nylon) for their wound closure. Wound closure was performed using interrupted skin sutures in each case. No subcutaneous sutures were used. Fifty patients were included in each group. The demographics of each group along with the procedures performed are summarised in Table 1. The postoperative instructions to patients varied according to the procedure performed.

Two weeks following surgery, patients were asked to attend their general practitioner's surgery for removal of

Table 1 Demographics of study group and outline of operations performed

		Absorbable	Non-absorbable
Number of patients		37	33
Age (years)		54.0 (range, 16–88)	57.3 (range, 24–94)
Male:female		8:29	13:20
Operation	CTD	22	14
	Excision	5	10
	Dupuytren's	3	4
	Trigger	4	3
	Other	3	2

CTD, carpal tunnel decompression; Excision, excision of soft tissue lesion; Dupuytren's, Dupuytren's contracture release; Trigger, trigger finger release.

sutures (non-absorbable group) or for a wound review (absorbable group). Patients were reviewed in the hospital out-patient clinic at 6 weeks following surgery for evaluation of any complications relating to the wound.

Final assessment of the wound was performed at 3 months by postal questionnaire. This comprised several outcome measures including a linear visual analogue scale (VAS) to assess for wound satisfaction (range 0 [not satisfied] to 100 [fully satisfied]), a validated 6-point patient scar assessment tool[2] (range 1 [normal skin] to 6 [worst scar imaginable] for each of 6 items) and the shortened version of the disabilities of the arm, shoulder and hand questionnaire, QuickDASH.[3]

Statistical analysis was performed using a non-parametric Mann–Whitney U-test and results were analysed using Winks SDA software (Texasoft, Cedar Hill, TX, USA).

Results

At the 6-week assessment, no episodes of wound dehiscence, haematoma or infection were noted. From the postal questionnaire, 70 responses were received including 37 from the absorbable group and 33 from the non-absorbable group. Non-responders were sent a further explanatory letter along with another copy of the questionnaire. No further responses were received from these patients.

Mean visual analogue scale scores for wound satisfaction were 82.5 for the non-absorbable group and 80.4 for the absorbable group. There was no statistically significant difference between the two groups (P = 0.823). Mean Quick DASH scores were 21.7 (non-absorbable group) and 21.1 (absorbable group), P = 0.86. The patient scores from the patient scar assessment scale were compared between the two groups. No statistically significant differences were found as shown in Table 2.

Table 2 Patient scar assessment scale results

Patient scar assessment scale	Absorbable (Mean score)	Non-absorbable (Mean score)	*P*-value
Pain	2.5	2.3	0.698
Itch	1.9	1.9	0.995
Colour	2.5	2.5	0.693
Stiffness	2.3	2.8	0.343
Thickness	2.2	2.5	0.235
Irregularity	1.9	2.2	0.742

Discussion

The choice of suture material for any procedure should be based upon an understanding of both the physical properties of the material and the likely tissue response to the material. Sutures that initiate a more significant tissue response (mainly absorbable sutures) may lead to sub-optimal outcomes including persistent scar tenderness and suture extrusion.[4] Non-absorbable sutures can cause pain on suture removal and suture marks on the skin.[5] These factors can result in a less satisfactory aesthetic result being perceived by patients. Patients in our study received size 3/0 suture material, as this is our agreed departmental policy for most upper limb surgery apart from paediatric patients who receive 4/0 suture. In addition, our nursing staff find removal of 3/0 suture to be much easier in the out-patient setting.

The ultimate goal of wound closure is to obtain a functional result that is also cosmetically pleasing for the patient. Our study has shown no significant difference between both absorbable and non-absorbable suture groups for wound satisfaction. This is highlighted by the results for both the VAS and the patient scar assessment scale. The patient scar assessment scale has been shown to be a reliable tool for the assessment of linear scars.[6] Both scoring methods were used as the VAS does not provide detailed information regarding the technical wound imperfections that may affect overall aesthetic outcome. However, the VAS has been shown to be a useful way of documenting subjective modalities such as pain.[7] As patients' assessment of aesthetic outcome is also subjective, use of the VAS in this study is appropriate.

Results from the Quick DASH questionnaire suggest that the functional result obtained is not significantly different

when using either absorbable or non-absorbable sutures. This is an important point to be considered when deciding upon an appropriate wound closure method as optimum function is also an aim of wound closure.

The ratio of male to female patients in the two study groups was slightly different. We did not observe any discernable gender-related difference in either healing pattern, satisfaction or scar perception in our patients. A similar absence of gender-related difference in wound perception has been noted in relation to facial wounds.[8]

There are some limitations to our study. We did not assess the immediate postoperative or early (2 weeks following surgery) wound appearance. Some wound imperfections may have occurred during this time such as haematoma, prominent sutures that subsequently resolved by the time of clinical review at 6 weeks. However, as the relationship between wound appearance at time of suture removal and the eventual wound appearance is undetermined,[9] this initial assessment may not be so important for final aesthetic outcome of the wound. We included patients undergoing procedures on various sites on the wrist and hand. Clearly, the volar and dorsal skin in these areas has variations of inherent properties including elasticity, sweating potential and thickness. These factors may have an effect on wound healing and final aesthetic outcome unrelated to suture type. However, this study specifically compared aesthetic outcomes of the use of absorbable and non-absorbable sutures rather than outcomes relating to closure of volar and dorsal skin. Both volar and dorsal wounds were distributed within each of the two study groups.

The final assessment was by postal questionnaire at 3 months following surgery. The wound may continue to mature beyond this point and any further enhancement or detriment to the long-term aesthetic appearance was not determined by the study.

Conclusions

From this study, no significant difference exists in aesthetic outcomes of surgical scars following wound closure in elective day-case hand and wrist surgery using either absorbable or non-absorbable sutures. Either suture material can be used confidently with respect to overall aesthetic appearance in such patients.

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References

1. Quinn JV. Clinical wound evaluation. *Acad Emerg Med* 1996; **3**: 298–9.
2. Draaijers LJ, Tempelman FR, Botman YA, Tuinebreijer WE, Middelkoop E, Kreis RW *et al*. The patient and observer scar assessment scale: a reliable and feasible tool for scar evaluation. *Plast Reconstr Surg* 2004; **113**: 1960–5.
3. Hudak PL, Amadio PC, Bombardier C. Development of an upper extremity outcome measure: the DASH. *Am J Ind Med* 1996; **29**: 602–8.
4. Erel E, Pleasance PI, Ahmed O, Hart NB. Absorbable versus non-absorbable suture in carpal tunnel decompression. *J Hand Surg Br* 2001; **26**: 157–8.
5. Guyuron B, Vaughan C. A comparison of absorbable and non-absorbable suture materials for skin repair. *Plast Reconstr Surg* 1992; **89**: 234–6.
6. van de Kar AL, Corion LU, Smeulders MJ, Draaijers LJ, van der Horst CM, van Zuijlen PP. Reliable and feasible evaluation of linear scars by the patient and observer scar assessment scale. *Plast Reconstr Surg* 2005; **116**: 514–22.
7. Huskisson EC. Visual analogue scales. In: Melzack R. (ed) *Pain measurement and assessment*. New York: Raven, 1983; 33–7.
8. Tebble NJ, Thomas DW, Price P. Anxiety and self-consciousness in patients with minor facial lacerations. *J Adv Nurs* 2004; **47**: 417–26.
9. Singer AJ, Church AL, Forrestal K, Werblud M, Valentine SM, Hollander JE. Comparison of patient satisfaction and practitioner satisfaction with wound appearance after traumatic wound repair. *Acad Emerg Med* 1997; **4**: 133–7.