

EVALUATION OF ABSORBABLE AND NON-ABSORBABLE SUTURES IN A COHORT STUDYArvind Baghel¹, Anil Haripriya², Vibha Haripriya³**HOW TO CITE THIS ARTICLE:**

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ABSTRACT: OBJECTIVE: The study evaluated aesthetic and functional outcomes of wound closure using either absorbable or non-absorbable sutures. **METHODS:** In this analytical type of epidemiological study a cohort of 64 patients who had undergone hand and wrist surgery followed by wound closure with absorbable (36) and non-absorbable (28) sutures were observed over a period of time. Follow up of the patients was done after 2 weeks, one and a half month and final evaluation after 3 months. They were assessed using a linear visual analogue scale (VAS), a validated 6-point patient scar assessment tool and Disabilities of the Arm Shoulder and Hand (DASH) symptom scale. Data analysis was done using a non-parametric Mann-Whitney U-test and results were analyzed using SPSS 16 software. **RESULTS:** Almost non-significant results were obtained between the two groups in terms of VAS, patient scar assessment tool and quick DASH except the symptom of pain which was comparatively low in absorbable group. **CONCLUSIONS:** The study showed no difference between both the groups in terms of aesthetics. Hence any of this material can be used.

KEYWORDS: Absorbable suture; Non-absorbable suture; Surgery; Wound closure.

INTRODUCTION: Surgical wound never attains the same cutaneous tensile strength as of normal uncut skin. After two weeks of suturing, 3-5% of original strength will be attained by wound. At the end of one month about 50% of wound strength is achieved. All suture materials however are foreign bodies which ultimately generate an inflammatory response in the host environment.^[1]

The ultimate determinant in patient contentment after surgery to the upper limb is an acceptable cosmetic consequence. The ideal suture material should be easy to handle, create minimal tissue damage and should have a good knot. It should be non-allergic to patients and maintain its holding even in the case of infection.^[2,3]

Suture materials are available in absorbable and non-absorbable forms. Absorbable sutures need not be removed and therefore, save time and also reduce patient anxiety postoperatively.^[4] Absorbable sutures are placed well into subcutaneous tissue to eliminate dead space and into the dermis to minimize tension during wound healing. These are gradually broken down over time by various processes such as hydrolysis and proteolytic enzymatic degradation and are absorbed by the body. Absorbable sutures are also commonly used for subcuticular wound closure which if done in appropriate circumstances can confer better cosmetic results.^[5,6]

Non-absorbable sutures are more commonly used in dermatosurgery than absorbable sutures. These sutures should be just tight enough to approximate, not strangulate tissues. Non-absorbable sutures may be used as deep sutures to provide prolonged mechanical support. However, these will require removal post-operatively, depending on the healing potential of the patient and the location of the wound.^[7,8]

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Good suturing technique should eliminate dead space in subcutaneous tissues and minimize tension that causes wound separation.^[9,10] This study aimed to evaluate prospectively aesthetic results of wound closure using either absorbable or non-absorbable sutures.

METHODS: The study sample included 64 patients from the Surgical Department of different hospitals in Bilaspur. All the patients had under gone hand & wrist surgery. Exclusion criteria included patients with medical problems that affect wound healing such as diabetes mellitus. All patients were treated for hand surgery followed by wound closure with absorbable (36 Patients) and non-absorbable sutures (28 Patients). 3/0 Vicrylrapide™, Ethicon, UK was used for absorbable sutures and 3/0 nylon for non-absorbable sutures. Wound closure was done using interrupted skin sutures in each of the case. No subcutaneous sutures were used. The postoperative instructions were given to all the patients accordingly.

After 2 weeks of surgery, suture removal was carried out for the patients with non-absorbable sutures and follow up was done for the patients with absorbable sutures. Again after a period of one and a half month, patients were evaluated in the hospital for any complications relating to the wound.

Final assessment of the wound was done after 3 months by telephonic interview of all the patients. Patients were questioned in their local language and those who could not be contacted by telephones were approached personally. This consisted of several subjects including a linear visual analogue scale (VAS) to evaluate the wound satisfaction (Range 0[not satisfied] to 100[Fully satisfied]), a validated 6-point patient scar assessment tool^[11] (Range 1 for normal skin to 6 for worst scar imaginable for each of 6 items) and Disabilities of the Arm Shoulder and Hand (DASH) symptom scale to evaluate disorder of the upper extremity. It can be used to measure opening a tight jar, writing, pushing open a heavy door, gardening, carrying, washing, daily activities, pain when performing activities, weakness, and difficulty in sleeping etc.^[12]

Statistical analysis was done using SPSS (16.0) software. Non-parametric Mann-Whitney U-test analyzed the results at p-value less than 0.05.

RESULTS: The results showed no occurrence of hematoma or infection during the follow up of the patients after a period of 3 months in both the cases. The response rate of the study was 100%.

In the present study, mean visual analogue scale scores for wound satisfaction were 72.7 for the non-absorbable group and 70.6 for the absorbable group. Mean Quick DASH scores were 20.4 (Non-absorbable group) and 19.6 (Absorbable group). The patient scar assessment scale was compared between the two groups which revealed that the subjects with non-absorbable sutures (27.6%) reported scar to be painful. Almost similar percentage of cases revealed problems like stiffness of scar, change in the color of scar, and irregularity of scar. Both itching due to sutures as well as thickness of sutures was mostly felt by patients with absorbable sutures as mentioned in Graph 1. Table 1 clarifies that only the symptom of pain was seen to be statistical significant between both the groups.

DISCUSSION: Suturing has been used all the way through the ages to assist healing of human tissues by wound closure. Earlier, animal fibers were used as thread and the needles were fashioned from animal bone or bits of metal. Nowadays, sterilized sutures have mostly replaced these materials but the essential principles remain the same.^[13]

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Skin sutures are tied without stress to permit postoperative edema; otherwise it leads to the formation of scars. Location of a wound in area of significant movement or over a bony prominence leads to wound tension, results in widening of the scar.^[14]

Inadequate closure of wound is an important factor as the facial layers give strength to wound closure. If the fascia is disrupted, the wound separates. The present study showed that absorbable sutures showed less painful results compared to non-absorbable ones. Absorbable sutures are biodegradable as they easily degrade inside the body. Over a period of time, the body absorbs the suture material. However, patients feel pain during the removal of non-absorbable sutures. The findings of this study were in contrast to the Kundra et al comparison of absorbable and non-absorbable sutures.^[4]

Non-absorbable sutures also revealed more stiffness and irregularity of scar. These factors can result in a less satisfactory aesthetic result being perceived by the patients. The ultimate goal of wound closure is to obtain a functional result that is also cosmetically pleasing for the patient.

Onwuanyi et al.^[15] compared subcuticular and interrupted transdermal non-absorbable sutures in wound closure after an uncomplicated appendicectomy. Significantly more complications such as pain, itching, and scar hypertrophy was observed in the interrupted closure group.

Serour et al.^[16] conducted a clinical trial among 216 children with acute appendicitis with standard skin closure using interrupted absorbable subcuticular sutures. These patients were not randomized and all the wounds were closed with an identical technique. It was found that overall infection rate was as low as 1.8%.

Ejerhed et al.^[17] compared stability and clinical results of absorbable or non-absorbable sutures and no differences were found. Radiographically, cystic formations in conjunction with the drill holes were seen with equal frequency, regardless of whether absorbable or non-absorbable suture anchors were used.

Overall the present study observed no satisfactory significant difference between both absorbable and non-absorbable suture groups. This is highlighted by the results of VAS, the patient scar assessment scale and DASH symptom scale. Van de Kar et al also used patient scar assessment scale as tool for the assessment of linear scars.^[18]

The VAS assessment has been shown to be a useful way of documenting subjective modalities such as pain. Also assessment of aesthetic outcome is subjective with the use of the VAS. The study showed non-significant results by Quick DASH questionnaire for absorbable or non-absorbable sutures and the results were comparable with other study.^[4]

CONCLUSIONS: The study concluded that there was no significant difference in terms of aesthetic outcomes of surgical scars after wound closure using either absorbable or non-absorbable sutures. But frequency of pain was more in case of non-absorbable sutures. Both the suture materials can be utilized confidently with respect to aesthetic appearance.

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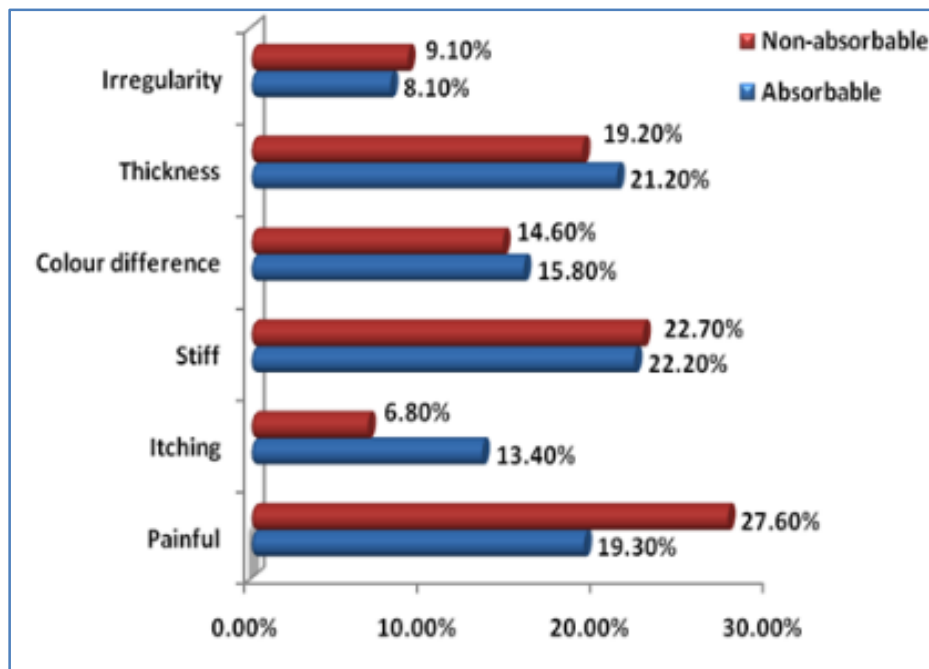
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Scar Assessment	Absorbable		Non-Absorbable		P-value
	Mean	SD	Mean	SD	
Is the scar painful	2.1	1.863	3.5	2.947	0.045
Is the scar itching	1.6	1.354	1.3	1.478	0.502
Is the scar having stiffness	2.7	2.467	3.2	2.893	0.378
Color difference of the scar	1.9	2.083	2.1	1.384	0.521
Thickness of scar	2.6	2.456	2.7	2.361	0.873
Irregularity of scar	1.2	1.465	1.6	1.352	0.437

Table 1: Mean scores of patients with scar assessment scale



Graph 1: Frequency of patients with scar assessment

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