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SINGLE VERSUS TWO LAYER SUTURING FOR WOUND CLOSURE AFTER INGUINAL HERNIA REPAIR

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ABSTRACT

Objective: Method of skin-subcutaneous closure after inguinal herniorrhaphy affects the operation time and immediate outcome of the wound. The study was aimed to assess the effects of a single layer closure of the skin and subcutaneous wound of inguinal herniorrhaphy, in contrast to the conventional two layer closure.

Method:

Design: Prospective randomized controlled trials.

Setting: Obafemi Awolowo University Teaching Hospital Ile-Ife, Osun State, Nigeria.

Patients and Method: All adult patients attending surgical out patient clinic with uncomplicated inguinal hernia and had surgery, after randomization into two groups from June 2000 Dec 2005 were included in the study. One group had one layer - closure i.e. closure of skin and subcutaneous tissues together at once while the second group had two layer closure i.e. closure of skin and subcutaneous tissues separately. Duration of operation and complications were documented for comparison.

Results: One hundred and eighty wounds were studied in 160 patients; the extra wounds being from bilateral inguinal hernias. There were 93 wounds in group one (two layer closure) and 87 wounds in group two (one layer closure. There was no significant difference between healing of wounds and appearance of scars in both groups. The single layer closure group was, however, apparently quicker. (P= 0.006).

Conclusion: The immediate outcome of the wound in both groups was similar. The medical personnel time was saved by closing the wound in single layer.

Key Words: Inguinal herniorrhaphy, wound closure. *(Accepted 25April 2008)*

INTRODUCTION

Over the years, a variety of methods and techniques of surgical wounds closure (midline abdominal and groin) have been used with success[1]. Initially, the midline wounds were repaired in 4 layers; namely peritoneum, fascia, subcutaneous and the skin[2-7]. Based on the work of Mehta *et al*[8] mass closure techniques for midline abdominal wounds was adopted[7, 9, 10, 11]. Separate subcutaneous layer closures had traditionally been practiced in order to obviate any haematoma or seroma collecting space and to reduce tension on the skin (cutaneous) sutures[2, 6]. In inguinal herniorrhaphy, after repairing the external oblique aponeurosis, closure of skin and subcutaneous layer of the wounds had attracted the use of different methods and materials [1, 2, 6, 7, 12-15]. Method of skin-subcutaneous closure after inguinal herniorrhaphy affects the operation time and immediate outcome of the wound[6]. We were prompted to test out the applicability of some of the above studies in inguinal herniorraphy wounds. We aimed at determining the similarity or difference in result with a single layer or two layer closures of skin and subcutaneous wound after groin herniorrhaphy. The null hypothesis was that neither of the two methods of skin wounds closure had an advantage over the other.

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PATIENTS AND METHODS

Consecutive adult patients who required inguinal hernia repair presenting at the Obafemi Awolowo University Teaching Hospitals' Complex Ile-Ife, Osun State, from June 2000 December 2005 were included in the study. Patients with their wounds were assigned to one layer subcutaneous and skin closure (group 1), or separate two layer subcutaneous and skin closure (group 2), using systematic sampling method. Informed consent was obtained from each patient, while permission for the study was obtained from the hospital ethics committee. Patients with obstructed, strangulated or recurrent hernia as well as obese (B M I> 35kg/m2 was regarded as obesity), diabetes mellitus or hypertension were also excluded from the study. Either a consultant or senior registrar using an agreed standard protocol carried out all the operations. Skin preparation with cetrimide, chlorhexidine and 70% alcohol were done for both groups. We used 40-60ml of 0.5% lignocaine with adrenaline as local anesthesia for all the patients. The technique of posterior wall repair was by modified Bassini with use of Nylon darn[16]. Before skin closure all visible subcutaneous blood vessels were ligated or diathermized.

The thickness or depth of subcutaneous layer for each patient was estimated with suture which was measured with a tape rule in all cases.. For the two layer closure, the subcutaneous tissue was closed with chromic catgut while the skin was closed with 2/0 Nylon-both of interrupted suturing technique. The single layer group were closed with 2/0 Nylon taking the subcutaneous tissue and skin together, also with interrupted suturing technique. Prophylactic antibiotics were not used as all were clean (class I) wound[17]. The assessing surgeon who was had no information about the method of closure undertook inspection of the wound on the 3-4th and 7th day post operation. Stitches were usually removed on the 7th day by which time most of the wound were healed with good skin apposition. Some of the wounds with complications took a further one week to heal. Thereafter further assessments were made at intervals of two and four weeks for a total follow up of 3 months. During these times, wound sepsis, indurations, haematoma, dehiscence, raw area and stitch sinus were looked for. Wound sepsis was defined as purulent discharge with positive culture.

DATA ANALYSIS

Data collected included patient's age, gender, hernia types, and duration of hernia before operation, subcutaneous thickness, and type of closure, operation time and complications. Data was entered into an IBM compatible computer and analysed using the spss for windows package version 11.5. The categorical data were compared with the method of closure using chi square and Fischer's exact test where appropriate. The continuous variables were compared with method of closure using Mann Whitney test. Probability Values = 0.050 was considered statistically significant.

RESULTS

One hundred and eighty wounds were studied in 160 patients; the extra wounds being from bilateral inguinal hernias. There were 144(90.0%) males and 16(10.0%) females .Patients ages ranged from 18-85 years and median was 52years. There were 93 wounds in group one (two layer closure) and 87 wounds in group two (one layer closure). The age range in group one was 18-85years with a mean of 55.2years; standard deviation of 16.3years and median of 60years. The age range in group two was from 20-82years with mean of 52.4years; standard deviation of 15.42years and median of 52years. There was no statistical difference in the gender P=0.189, hernia type P=0.478, complication P=0.785 in the two groups (Table1). The hernia type significantly affected the operation time in both methods; it took a longer time to repair inguinoscrotal hernia compared to inguinal hernia (0.009). Table two showed that there was no statistical difference Between the duration of hernia at presentation (P=0.071), subcutaneous thickness (P=0.541), and the age of patients at presentation (P=0.247). However there was a significant relationship between the method of closure and operation time (P=0.006). It took a shorter time to do the one layer closure as compared with the 2 layer closure.

Table 1: **Method of Closure with Gender, Hernia Type and Complication.**

Variables		Two Layer Closure N=93	One Layer Closure N=87	P- Value
Gender	Male	85	84	0.189
	Female	8	3	
Hernia	Inguinal	68	66	0.478
	ISH	25	21	
Complication	Nil	52	59	
	Wound Indurations	25	15	
	Wound Sepsis	4	2	0.785
	Wound Haematoma	10	8	
	Raw Area	0	1	
	Wound Dehiscence	2	2	
Total		93	87	

Table2: **Method of Closure with Duration of Hernia, Subcutaneous Thickness, Age and Operation Time.**

Variables	Mean Rank		P Values
	2 layered closure	1 layer closure	
Duration of hernia	70.04	58.45	0.071
Subcutaneous thickness(cm)	64.05	60.17	0.541
Age(years)	67.93	60.37	0.247
Operation time(minutes)	72.25	55.45	0.006

DISCUSSION

Different methods of skin closure for laparotomy or groin herniorrhaphy wounds have occupied the attention of surgeons over the years[7-9]. This is because patients' satisfaction after the surgery depends on the cosmetic appearance of scar, as well as incidence of wound complications. For a long time, midline abdominal wounds were closed in layers. When the mass closure technique of midline laparotomy wound was introduced, the myth of layered closure was broken[9-11]. Anatomically, closing the subcutaneous and skin separately had been used not only to obliterate a potential vacuum in the subcutaneous space, but also to reduce tension on the skin suture thereby reducing the risk of bad scar. However, some surgeons had observed that taking the cutaneous as well as the subcutaneous in one bite (one layer) or two different bites (two layers) resulted in similar healing rates for midline laparatomy wounds[8,10,11]. Similarly, various suture materials and techniques have been compared for groin hernia wounds with reference to the rate of wound healing [2,12,15]. This present study has

sought to compare two methods of skin closure for groin hernia wounds. We observed that wound-healing rates in the two groups were similar. However for the one layer closure, it is necessary to include the membranous layer of Scarpa's in the suturing. The mean operation time for single layer closure was shorter (p=0.006).The complications were similar in the two groups. The type of hernia also significantly affected the operation time, being shorter in inguinal hernia compared with inguinoscrotal hernia (p=0.009). These findings are in keeping with findings by other workers[12, 15]. The null hypothesis therefore stands for the two method of closure. It can therefore be concluded that with exclusion of obese patients, hypertensive patients and complicated groin hernia, one layer skin closure technique for hernia wounds can be conveniently and safely used as an alternative to two layer closure. Furthermore, catgut (plain or chromic), may occasionally stimulate continuous xenograph versus host reaction and instead of complete absorption, may result in rejection with improper healing[8, 15]. If this happens in a patient with thin subcutaneous layer, stitch sinus may result. For this, one may further suggest that if groin wounds can heal well without separate subcutaneous suturing as shown in this study, then single layer closure can be used as an alternative to two layer closure. Further studies with larger sample size will be required in the future to substantiate the findings in this study. It may be necessary also to access the cost implication of the single layered closure as compared to two layered closure.

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