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COMPARISON OF WOUND INFECTION AFTER APPENDECTOMY IN WOUND HEALING WITH AND WITHOUT THE SUBCUTICULAR SUTURES

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ABSTRACT

Introduction: One of the risk factors for wound infection techniques, how and when to close the wound after surgery. Various methods have been proposed for closure this study, we compared the wound healing wound infection after appendectomy in subcutaneous tissue with or without the use of sutures was performed.
Methods: This study was a randomized clinical trial in general surgery ward of Imam Reza Hospital during the years 2014-15 took place. The study population of 208 patients who were divided with a clinical diagnosis. In the first group appendectomy wound closure separate subcutaneous tissue and skin were sutured with nylon thread for sutures vertical matrix and the second group without the use of sutures under the skin and the skin just like the first group was close. In four innings of the third, seventh, one and three months after surgery were followed in the surgeon's office.
Findings: In this study, 126 patients (60.7 %) were male and 81 patients (39.3%) were female. The overall average age was 10.53 ± 32.48 years. 4.9% of patient had infections and 95.1% had not infection and not were observed statistically significant relationship between the two groups in terms of infection ($p<0.05$).
Discussion: The results of this study showed that in terms of wound infection there was no significant difference between the two methods and both methods can be used in wound healing.

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Introduction

Appendectomy is one of the most common emergency surgical procedures in the world(1, 2).The most common postoperative complication after appendectomy is superficial surgical site infection (SSI) (3),despite the routine use of prophylactic antibiotics that target both aerobic and anaerobic organisms,infection of the operative incision is the most common cause of

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morbidity after appendectomy (4) .which infection especially occurs in complicated appendicitis (i.e., gangrenous, and ruptured appendicitis) (5). Superficial SSI causes readmission, increases the length of stay, nursing care, and prolonged antibiotic treatment (6, 7).Consequently, this results in an increase of both direct and indirect medical costs to both health care providers and patients(6, 7). Postoperative SSI can be minimized by reducing risk factors
(e.g., smoking, or glucose control)(8, 9),or use of established preventive procedures (e.g., prophylactic antibiotics, avoid surgical drain, and unnecessary hair removal) (8). Closure of the wound for a contaminated wound also affected SSIs (8, 10, 11).

The highest prevalence of appandisit is in the second and third decades of life. Many patients, especially young people's demand for minimum scarring after the surgery, one of the most important criteria for beauty scarring after surgery is the width of scar (12).

However scar in Subcuticular sutures less than Interrupted sutures, and both is accepted a component of wound closure methods in appendis. But because of traditional education to close the wound, due to infection and abscess of the appendis, the emphasis is on closing the wound using Seprate sutures. Therefore this study was to compare two methods of wound infection in subcutaneous and vertical matris(12).

Method and materials

This study as a randomized clinical trial was conducted in general surgery ward of Imam Reza Hospital during the years 2012-2013. The population of the study consists of 208 patients who received a clinical diagnosis of appendicitis and underwent appendectomy by a surgeon. Intervening variables such as the skill of the surgeon, contamination during the operation and technical conditions were identical in both groups. Patients with complicated appendicitis were also affected by some diseases such as acquired immune deficiency and diabetes and had taken immune-suppressant drugs or the ones with no possibility to be followed up were excluded. The samples were divided into two groups of 102 and 104.

In the Group A and Group B, respectively. Simple random sampling was used for each group. In all patients, before the surgery, the spot was cut and opened under general anesthesia. Patients being cut in the Mcburny underwent appendectomy operation. In the first two groups, appendectomy wound healing was done via separate sutures of subcutaneous tissue by cotton thread and skin healing was done by nylon thread as vertical matrix sutures. IN group B, it was done without using subcutaneous sutures and just skin closing like the first group. Patients were followed up in the surgeon's office for 4 times, i.e. the third and seventh days as well as one and three months after surgery. In visiting patients, the surgeon examined the patients for symptoms of infection and the presence of purulent discharge from the wound, pain, warmth at the site, swelling and erythema, and fever. The final diagnosis of infection was upon the surgeon based on the infection definition and symptoms.

Patients who have had one of the complication or infection were considered positive. Then, the relevant information was obtained from each patient and data were statistically analyzed through SPSS16.

For the variable age, the KS test, Mann-Whitney U, and independent t-test were run and X2 test was used for other variables. Lamination method was used to remove the effects of intervening variables.

Results: The study was conducted in 126 patients (60.7 %) were male and 81 patients (39.3%) were female. 102 cases (49.5%) under 30 years, 94 patients (45.6%) between 30 and 50 years and 10 patients (4.9%) were between 50 and 75 years. The overall average age was 10.53 ± 32.48 years. The average age in the group without closing the subcutaneous tissue of 10.86 ± 32.73 years and in subcutaneous tissue by closing 10.25 ± 32.24 years. Between the ages of the two groups with and without closing the subcutaneous tissue statistically significant relationship was found(P=0/850)

In this study, 102 patients (49.5%) Subcutaneous tissue was not closed and in 104 patients (50.5%), subcutaneous tissue, blocked a total of 10 patients (4.9%) had infections and 196 cases (95.1%) had not infection. Of the 10 people who were infected six patients (5.9%) without closing the subcutaneous tissue and 4 patients (3.8%) with closing the subcutaneous tissue. between samples, 96 patients (94.1%) without closing subcutaneous tissue and 100 patients (96.2%) to close the subcutaneous tissue not were observed statistically significant relationship between the two groups in terms of infection.(table 1)

The frequency of infection in groups according to age groups showed that 4 patients (3.9%) in the age group 30 years and less infection that 3 patients (5.7%) without closing the subcutaneous tissue and 1 patient (2%) by closing the subcutaneous tissue. 98 patients (96/1%) were also infected 50 patients (94/3%) without closing the subcutaneous tissue of 48 patients (98%) were by closing the subcutaneous tissue. And in the age group above 30 years, 6 patients (8.5%) were infected 3 patients (6.1%) without closing the subcutaneous tissue, and 3 patients (5.5%) were by closing the subcutaneous tissue. 98 patients (94.2%) were infections that 46 patients (93/9%) without closing the subcutaneous tissue of 52 patients (94.5%) were by closing the subcutaneous tissue. Statistically between the two groups equal or less than 30 years of age (P =0.347) and over 30 years (P = 0/884), had no evidence of infection (table 2).

Table1. Compare infection rates between the two groups

groups	Infection	Without infection	X2 test
with closing the subcutaneous tissue	4 3.8%	100 96.2%	P= 0/497
without closing the subcutaneous tissue	6 5.9%	96 94.1%	

Table 2.The frequency of infection in groups according to age

age			with closing the subcutaneous tissue	without closing the subcutaneous tissue
Equal or less than 30 years	infection	yes	2%	5.7%
		no	98%	94.3%
More than 30 years	infection	yes	5.5%	6.1%
		no	94.5%	93.9%

Discussion

In this study, patients were studied in two groups with and without closure of subcutaneous tissue after repairing of the appendectomy surgery. In this study, 60.7% of patients were male and 39.3% were female. In terms of gender, no statistically significant relationship was found between both groups with and without closure of subcutaneous tissue. In Qaderi's study (12), 61.2% and 38.8% of patients were male and female, respectively. There was no significant difference between two groups regarding gender. In Jafari's study(13), 46 % and 54% of participants were female male in the first group. Considering the second group, 47% and 53% were female and male, respectively. The gender of two groups showed no significant difference. The results are consistent and match with the results of the current study.

The mean age for the group without closure of subcutaneous tissue was 32.73+ 10.86 years. This value was equal to 32.24 + 10.25 years for the group with closure of subcutaneous tissue. In this regard, there was no statistically significant relationship.

In Qaderi's study (12), the mean age of patients in the interrupted suture in appendectomy wounds group was 25.32 years and the mean of the discrete suture in appendectomy wounds group was 24.08 years and there was no significant difference between the two groups with regard to age. In Jafari's study(13) , the mean age of patients in the transdermal and subcuticular groups was 20.85 ± 6.7 and 20.61 ± 6.58 years, respectively. No significant difference was observed in this regard. Therefore, gender and age distribution was similar to studies conducted inside and outside the country. Of these patients, 4.9% had infections and 95.1% had no infection. Of those who had infection, 5.9% and 3.8% were without and with the closure of the subcutaneous tissue, respectively. Of those patients with no infection, 94.1 % and 96.2% were without and with the closure of the subcutaneous tissue, respectively. There was no statistically significant relationship between infections of two without and with the closure of the subcutaneous tissue groups.

In this study, two methods of subcutaneous tissue ligation (i.e. without and with the closure of the subcutaneous tissue) in appendectomy surgery were compared with regard to infection; however, no significant difference was noticed between these two groups. The Qaderi's study (12), no significant difference was observed between two groups in terms of surgical site complications. In a research study (14), infection rate significantly increased in appendectomy wound healing using subcuticular technique with absorbable suture thread compared with transdermal technique using non-absorbable nylon suture. This difference may be due to the type of techniques used in the study. In another study (15), the average time to stitch the wound and the cost of consumables for the subcuticular group were less than those for transdermal group; however, wound infections were similar in both groups. In another study (16), surgical wound complications in the two groups showed no significant difference, while subcuticular technique, in comparison with transdermal technique, was the preferred one in terms of beauty and not requiring the sutures to be removed.

In Jafari's study (13), a week after surgery, 9 percent of subcuticular restorations and 6 percent of transdermal restorations were locally infected.

And there was no statistically significant difference between two groups. A week after surgery, 5% of subcutaneous wound healing and 4% of the wounds with transdermal healing discharged and their wound was open and no significant difference was observed between two groups of this study in this regard. Moreover, In Naumann's study (17), there was no significant difference between two groups of fascia ligation and fascia non-litigation in terms of infection. The results of various studies were consistent with the results of this study.

In a study conducted by Khajouie Kermani (18), over a 14-month follow-up study of appendicitis, he found out that no difference in complications after surgery and wound closure using discrete and interrupted sutures was observed. In some studies, it was shown that layered sutures in animal models increase wound complications (19, 20).

In addition, in another study (21), it was shown that the thickness of the subcutaneous tissue is a risk factor for wound complications. In Cetin's study (22), it was also shown that the subcutaneous tissue repair in women cesarean, with subcutaneous tissue thickness greater than 2 cm, can dramatically reduce the amount of scarring of these wounds. Of course, lack of attention to the thickness of the subcutaneous tissue in this study is a limitation.

Conclusion: In this study it was found that the difference between subcutaneous tissue ligation of infection there was no significant difference can therefore be said to prevent infection, follow these guidelines: Shave wound, skin preparation, observing sterility, the use of prophylactic antibiotics, less use of cautery.

However, results from laboratory studies in this area indicate that the closure of the subcutaneous layers of wound infection raises the dead and not closing it also creates space and increase the likelihood of prescribed hematoma and as a result infection. In fact, the advantage of subcutaneous tissue ligation, eliminating the potential space and reduce the accumulation of subcutaneous hematoma and scar tissue after surgery due to suture the epidermis is better. And the advantage of using less than suture closure of the subcutaneous tissue and subcutaneous foreign body. So that the use of additional stitches the wound is susceptible to infection. So based on the results of this study can be said that both methods can be used in wound healing.

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