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# Use of Absorbable Suture in Subcutaneous Cell Tissue and Its Impact On The Reduction of Collections in Abdominal Surgical Wounds Experience At The University Hospital "Dr. José Eleuterio González"

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## Abstract

**Introduction:** Sutures most commonly provide mechanical support for the closed wound during its initial healing. They approximate the wound edges and help maintain wound closure until the healing process provides sufficient force for the wound to withstand stress and strain.

**Materials and methods:** Retrospective, descriptive, comparative and observational study. It was carried out in the general surgery service of the University Hospital ''Dr José Eleuterio González'' where cases of 30 patients who underwent uncontaminated abdominal surgical procedures in the period of time between January 2020 - September 2020 were analyzed.

**Results:** The average hospital stay of all patients was 11 ± 3.1 days. The participants in group A showed a mean of 11.2 ± 3.4 days, while those in group B showed a mean of 10.9 ± 2.9 days without showing a significant difference between both study groups. In group A, 4 (25%) of the patients showed seroma, while 12 (75%) did not, while in group B 4 (28.5%) showed seroma, and 10 (71.5%) did not.

**Conclusion:** The use of subcutaneous cellular tissue closure with absorbable suture did not show any benefit or harm in those patients who underwent it, so there was no decrease in the incidence of seroma, wound dehiscence, or decrease in hospital stay compared to other methods used.

## Introduction

The function of the suture is to restore anatomical relationships so that healing occurs optimally. It is not known for sure what the healing process is like, in fact we cannot improve it in cases where effective healing is needed, nor can we stop it when hypertrophic and keloid wounds form; thus, the less an uncomplicated wound is touched, the better its cosmetic result and the lower the risk of complications. Some surgeons recommend subcutaneous suturing, claiming that it decreases wound complications, while others think it is unnecessary and may increase wound complications.

Laparotomy is a surgical incision that is used to access the organs of the abdominal cavity and is one of the most common surgical procedures performed worldwide. Sutures most commonly provide mechanical support for the closed wound during its initial healing [1]. They approximate the edges of the wound and help maintain wound closure until the healing process provides sufficient force for the wound to withstand stress and strain. For most surgeons, the choice of suture material in a given case is primarily due to exposure to training and local opinion, and many surgeons are reluctant to try different techniques once their personal preferences have been established [1,2].

Surgeons affect the skin in most surgical procedures. Complications of abdominal wall closure are common and include seroma, hematomas, surgical site infection (SSI), dehiscence, positional hernia, and granuloma formation. Most surgical wounds are sutured flat at the end of the procedure. The skin is the outermost layer of tissue in the human body, and the subcutaneous tissue is just below it [3]. The use of sutures in the subcutaneous tissue after surgery is controversial. Some surgeons recommend it and claim that it decreases wound complications, while others think it is unnecessary and may increase wound complications including suture-associated infections. Currently there is very low quality evidence that is insufficient to support or reject subcutaneous closure (SCC) after exploratory laparotomy. The use of the SCC has the potential to affect patient outcomes and utilization of healthcare resources. Additional well-designed trials with low risk of bias are needed [4,5].

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In other anatomical parts of the body, it has been proven that the closure of the subcutaneous cellular tissue reduces the risk of the appearance of collections, as is the case with inguinal plasties in comparison with compression bandages and in neck surgeries such as cervicotomies. In a plastic surgery study in which they performed Scarpa's fascia closure after performing abdominal liposuctions and abdominoplasties, they found that the closure of Scarpa's fascia with absorbable suture was related to a decrease in the formation of seromas in its equivalent to the use of drains in surgical bed. It is believed that when performing a simple suture on subcutaneous cellular tissue, the dead space between the tissues decreases and this favors healing and decreases the formation of collections: There are those who argue that said closure increases wound infection due to the increase in inflammation in the area due to the reaction to a foreign body of the suture with the subsequent colonization of bacteria and SSI, all this without current scientific verification [6].

The objective of this study was to determine and compare the advantages and disadvantages of closing subcutaneous cellular tissue with absorbable suture in uncontaminated abdominal surgical wounds. The hypothesis was that the closure of subcutaneous cellular tissue with absorbable suture reduces the formation of seromas in uncontaminated abdominal surgical wounds.

## Method

Retrospective, descriptive, comparative and observational study. It was carried out in the general surgery service of the University Hospital "Dr José Eleuterio González" where cases of 72 patients who underwent uncontaminated abdominal surgical procedures in the period of time between January 2020 - September 2020 were analyzed.

The inclusion criteria that were integrated to carry out this study were: Patients older than 18 years of age, gender indistinct, patients who underwent uncontaminated abdominal surgical wounds, patients that did not represent data on abdominal peritonitis or sepsis, patients hemodynamically stable, patients with adipose pad greater than 1 cm, patients dependent on mechanical ventilation, patients who speak the Spanish language. Exclusion criteria were: patients with data of bacterial peritonitis or abdominal sepsis, hemodynamic instability, need for immediate mechanical ventilation, patients with an adipose pad less than 1 cm thick, patients who underwent a contaminated abdominal surgical wound and surgical wounds by laparoscopic ports. The elimination criteria used were: incomplete data in the collection sheet and those patients who refused to participate in the study.

The description of the design of this study consisted starting with an analysis of the variables obtained such as weight, body mass index, type II diabetes mellitus, systemic arterial hypertension, dyslipidemias, preoperative diagnosis, type of surgery and wound closure technique. The records were kept by means of folio without using the name or record of the patients for data management and said folios were linked with the name of the patients in a list that was kept by the main investigator without access for the rest of the team research, adjusting to current data protection laws.

In the analysis of qualitative variables, the Chi-square test or Fisher's exact test was used in the case of independent groups. For the quantitative variables, they were evaluated with a student's T of independent samples for parametric distribution and Mann Whitney's U test for non-parametric distribution. A value of $p < 0.05$ was taken as statistically significant. SPSS version 21 was used to perform the statistical analysis.

## Results

The study consisted of 72 patients in such a way that they were divided into 2 groups: Group A which included patients where subcutaneous closure was performed after their operation (37 participants) and Group B where patients were classified without subcutaneous closure (35 participants). Of the 72 patients studied, 48 (66.6%) were men and the remaining 24 (33.3%) were women. Of the 37 members of group A, 23 (62.2%) were men and 14 (37.8%) were women, while in group B 22 (62.8%) of the participants were men and the remaining 13 (37.2%) were women.

The age of the patients in general obtained an average of 41.23 ± 10.64 years. In group A, a mean age of 39.94 ± 11.83 years was shown, while in group B the mean age was 42.71 ± 9.30 years, $p = 0.22$, not significant.

Of the pathological personal antecedents most commonly presented in the general population, the most frequent was being overweight, showing up in 38 (52.7%) of the participants. In group A, as in the general population, overweight was the most common in 14 (37.8%) of the cases, 9 (24.3%) of the patients were obese, 11 (29.7%) were reported with DM II , and only 2 (5.4%) were hypertensive. In group B, 15 (42.8%) were overweight, 10 (28.5%) were obese, another 10 (28.5%) showed DM II, as well as the remaining 7 (20%) had hypertension (Table 1)

Within the non-pathological personal antecedents, it was reported that in group A 16 (43.2%) consumed tobacco, 11 (29.7%) had alcoholism while 9 (24.3%) did not have any non-pathological personal history (NPPH). In group B 10 (28.5%) people used to smoke tobacco, 7 (20%) had alcoholism, while the remaining 16 (45.7%) patients did not show any NPPH (Table 2).

The average hospital stay of all patients was 11 ± 3.1 days. Participants in group A showed a mean of 11.2 ± 3.4 days, while those in group B showed a mean of 10.9 ± 2.9 days without showing a significant difference between both study groups. $p = 0.45$, not significant.

The most frequent surgical wound at the time of preparing this study was the clean wound, which was made in 43 (59.7%) of the occasions, while the remaining 29 (40.3%) were clean-contaminated wounds, speaking of the population. usually. From group A, the type of surgical wound that was performed more frequently was clean, being carried out on 21 (56.7%) occasions, and clean-contaminated wounds were performed on 16 (43.3%) occasions. In group B on 22 (62.8%) occasions the surgical wound was clean, while in 13 (37.2%) it was clean-contaminated.

It was recorded whether there was a collection in the total population, where 19 (26.4%) showed seroma, while the remaining 53 (73.6%) patients did not develop any collection. From group A, 9 (24.3%) of the patients showed seroma, while 28 (75.7%) did not, while from group B 10 (28.6%) showed seroma, and 25 (71.4%) did not. The reported results did not show significant differences between both groups.

In addition to seroma, other complications observed in the patients were reported, such as fever and wound dehiscence. In group A, fever was reported in 5 (13.5%) of the patients, in the same way that in 5 (13.5%) of them, wound dehiscence was shown, while the remaining 27 (73%) did not report any other complication. In group B, 5 (14.3%) of the patients developed fever, while only in 2 (5.7%) patients was wound dehiscence observed, on the other hand, the remaining 28 (80%) patients did not show any other complication. No significant differences were observed with the results of both groups.

***Table 1.*** Pathological personal history

| **PATHOLOGICAL PERSONAL HISTORY: Group A** | | |
|---|---|---|
| Background | Total patients | Percentage |
| Overweight | 14 | 37.8% |
| Obesity | 9 | 24.3% |
| DMII | 11 | 29.7% |
| Arterial hypertension | 2 | 5.4% |
| **PATHOLOGICAL PERSONAL HISTORY: Group B** | | |
| Total patients | Total patients | Total patients |
| Overweight | 15 | 42.8% |
| Obesity | 10 | 28.5% |
| DMII | 10 | 28.5% |
| Arterial hypertension | 7 | 20% |

***Table 2.*** Non-pathological personal history

| **NON-PATHOLOGICAL PERSONAL HISTORY: Group A** | | |
|---|---|---|
| Background | Total patients | Percentage |
| Smoking | 16 | 43.2% |
| Alcoholism | 11 | 29.7% |
| Without NPPH | 9 | 24.3% |
| **NON-PATHOLOGICAL PERSONAL HISTORY: Group B** | | |
| Background | Total patients | Percentage |
| Smoking | 10 | 28.5% |
| Alcoholism | 7 | 20% |
| Without NPPH | 16 | 45.7% |

## Conclusions

The use of subcutaneous cell tissue closure with absorbable suture did not show any benefit or harm in those patients who underwent it, so there was no decrease in the incidence of seroma, wound dehiscence, or reduction in stay hospital compared to other methods used.

Since mortality is unlikely to be affected by the use (or non-use) of subcutaneous closure, quality of life and costs will be the main factors determining which intervention is recommended by health funders.

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