

## Rives Stoppa Repair : Are Subcutaneous Drains Really Necessary?

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### Abstract :

**Background :** French surgeons Rives and Stoppa emphasized on a tension free repair for ventral incisional hernia with the use of prosthesis. They developed a technique of placing the prosthesis in the retrorectus plane between the rectus muscle and the posterior sheath which extended in the preperitoneal space below the arcuate line. Traditional teaching has always been insistent of placing subcutaneous drains in this repair. This study aims to compare the group of patients in which drains were placed to those without a drain. **Methods :** The study is a prospective study conducted over a period of 3 years at the largest tertiary care hospital of Western India. 65 patients operated in a single surgical unit are included in his study which were randomly distributed to the two groups - with drain placement and without drain placement. All patients were followed up for atleast 1 year and the complications compared. **Result and Conclusion :** The study concluded that the rate of surgical site infections (SSIs) were significantly higher in the group where drains were placed. The mean duration of hospital stay was increased by 2 days in the group with drain placement. There were no added complications observed in the group in which a drain was placed.

**Keywords :** Incisional hernia, Rives Stoppa Repair, Subcutaneous Drains

### Introduction :

Incisional Hernia is a protrusion beneath the skin of intra-abdominal viscera through a post-operative defect of the abdominal wall. Even as the techniques are advancing and even with the advent of laparoscopic surgery, the incidence of incisional hernia has increased.<sup>(1)</sup> In our centre, the number of patients being admitted with incisional hernia is constantly increasing. Previous training in surgical techniques always dictated the placement of a drain in an incisional hernia repair irrespective of the type of repair done.<sup>(2)</sup> A drain was placed in both prosthetic as well as non prosthetic hernia repairs. We observed that placement of a drain was also associated with a number of complications such as infection, pain, prolonged hospital stay. The open surgery repairs performed in our institute for an incisional hernia repair are 1. Preperitoneal meshplasty, 2. Retrorectus meshplasty (Rives Stoppa Sublay), 3. Onlay Meshplasty. The patients who were operated only for Rives Stoppa repair in a single unit of the surgery department of our institute were

included in this study. The drain which was included in our study is a negative suction wound drain placed in the subcutaneous plane above the anterior sheath.

### Methods :

The current study is a prospective study conducted over 3 years with randomized distribution of patients into two groups. Associated comorbidities were not considered in the distribution of the patients. The mean body mass index (BMI) of the patient in the study is 23.5. The patients included according to the Ventral Hernia Working Group classification were Grade One and Grade Two (24 patients).<sup>(3)</sup> The rest 11 patients were in Grade Three with all having previous history of SSI. A preoperative antibiotic Injectable Cefotaxim was administered 30 minutes before the incision.

An elliptical incision including the previous scar is made and adhesiolysis done as needed. An onlay plane is not made beyond the need for fixation of the mesh through the anterior sheath. The posterior rectus sheath at its most medial border, confirming the location of the rectus muscle ventral to the initial incision. The incision is taken along length of the defect, cranially to the xiphoid and caudally to the arcuate line and the space of Retzius. The posterior sheath is dissected free from the rectus abdominis medially to laterally until the lateral

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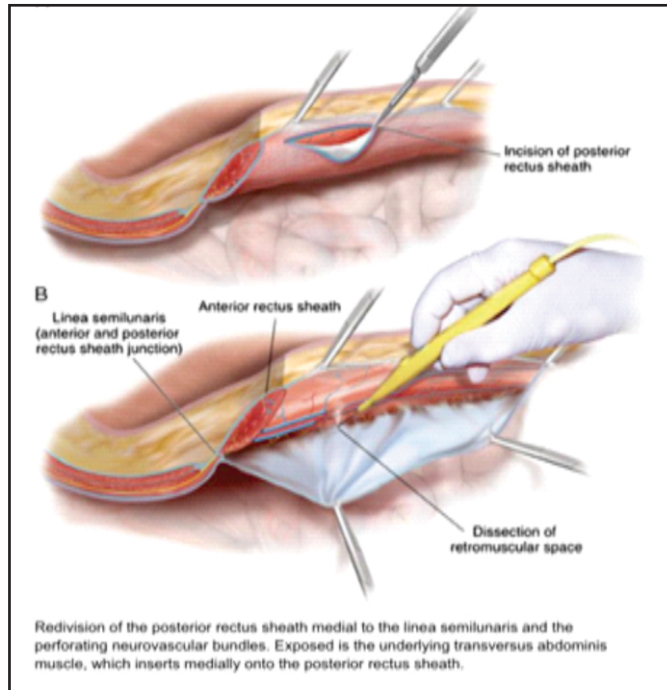
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edge of the rectus muscle is reached and deep perforating vessels are encountered. As the lateral edge is reached, the epigastric vessels can be visualized and should remain with the muscle body.

**Figure 1: Modified Rives Stoppa Repair** <sup>(2)</sup>



Below the arcuate line, blunt dissection is performed to reach the pubic symphysis and bilateral Cooper's ligaments. The posterior sheath is closed with a running absorbable suture. A lightweight macroporous woven polypropylene mesh of an adequate size is placed in the retrorectus plane created. The mesh was fixed with an absorbable suture with a 'hitch' stitch through the anterior sheath and cover atleast 5 cm beyond the original defect. Anterior sheath is opposed with absorbable interrupted stitches and subcutaneous drains placed/not placed according to the group. Subcutaneous layer and skin closed in layers. <sup>(4)</sup>

**Figure 2 : Negative suction drain**



The drain utilized in this repair is a negative suction drain of the size 16

The patients were followed up every 2 month for the first 6 months and then 3 monthly. A physical examination and supportive radiology was advised as required.

**Inclusion criteria:**

1. Age more than 16 years.
2. Mesh used- macroporous light weight woven Polypropylene(PP) mesh.
3. Sublay repair (Retromuscular/retrorectus repair)
4. Elective open surgery
5. Defect < 10 cm

**Exclusion criteria:**

1. Age less than 16 years
2. Mesh used- synthetic absorbable mesh, hybrid mesh.
3. Patients in which replacement (inlay) mesh placed for bridging anterior sheath.
4. Laparoscopic repair
5. Recurrent incisional Hernia
6. Emergency Surgery
7. Obstructed/strangulated incisional hernia.
8. Defect > 10cm

**Result:**

**Table 1: Distribution according to Drain placement**

Drain placed	No. of patients
No	30
Yes	35

Out of total 65 patients in study, 35 patients were operated and drain was placed and 30 were operated without drain placement. It was observed that the duration of stay in patients without a drain was significantly reduced. (p- value <0.0001) The above observation suggests how patients in which drain was placed had a longer duration of stay in the hospital (mean stay 4.1 days). 52% of the patients in the category of drain placed had the drain removed and discharged on or before POD-3 against the remarkable 87% discharged in the category with no drains. The criterion

**Table 2 : Distribution according to the Type of Incisional hernia**

Type of defect	Subtype	No of Patients
Midline	1. Supra-umbilical	13
	2. Infra-umbilical	12
	3. Supra and Infra umbilical	40

**Table 3 : Distribution according to duration of hospital stay**

Duration of hospital stay (post operative)	Without drain(30)	With drain(35)
<3days	26(87%)	13(37%)
4-6 days	3(10%)	18(52%)
<6days	1(3%)	4(11%)
Mean Hospital Stay	<b>2.6 days</b>	<b>4.1 days</b>

**Table 4: Distribution of patients according to complications**

Sr. No.	Complications	No. of patients without Drain (out of 30)	No of patients with drain (Out of 35)
1	Seroma	2 (7%)	3 (8.5%)
2	Hematoma	1 (3%)	0 (0)

**Table 5: Distribution according to affection of superficial and deep sepsis in the patients**

Sepsis	No of patients without drain (out of 30)	No of patients with drain (Out of 35)
Superficial sepsis	2 (7%)	15 (14%)
Deep Sepsis	0 (0%)	1 (2.8%)

**Table 6 : Distribution according to recurrence**

Variable	No. of patients without drain (out of 30)	No. of patients with drain (out of 100)
Recurrence	1 (3.34%)	2 (5.7%)

for removal of drain in all patients was when there was an output of <30 cc serous fluid.<sup>(5)</sup>

The maximum incidence of seroma formation in incisional hernia repair is observed in Onlay Meshplasty due to excessive dissection of the flaps. The incidence of seroma & hematoma formation in sublay meshplasty is significantly lowered as compared to other repairs, due to minimal dissection of the skin flaps. In our study, it was found that there were no differences in seroma (p value-0.85) and hematoma formation in both groups. Placement of a drain in Rives Stoppa repair has no benefits in terms of seroma formation. The patients who developed seroma were managed conservatively with only 5 patients requiring USG guided aspiration and 2 patients required re-aspiration.

The p value for the patients developing superficial sepsis was 0.1693 which was not significant. But with an increasing number of subjects in the study, the value can be of statistical significance. There have been no studies which have demonstrated the methods to define the type of infections in an incisional hernia repair. We have followed the CDC guidelines for the same.<sup>(6)</sup> Superficial sepsis (SSI) has been defined as the infection of only skin and the subcutaneous tissues where as deep sepsis (SSI) involves deep tissues, fascial and muscle layers. We have included mesh infection in the category of deep sepsis since the mesh is situated in the retrorectus plane. The SSI rate has been described for sublay repair to be 4% and 17% for onlay repair.<sup>(6)</sup>

The distribution of sepsis was attributed to drain placement by various surgeons but it was never proved and there is no Level-I evidence.<sup>(7)</sup> Superficial surgical site infection was characterized by local redness, pus discharge, tenderness or wound gaping.<sup>(8)</sup> The patients were followed with regular dressing and antibiotics according to pus culture. No surgical debridement or resuturing was done in any of the patients. The most common organism encountered was *Staphylococcus aureus*. Only 1 patient presented with deep sepsis who clinically had persistent fever and tachycardia beyond POD-4. The patient underwent a CT scan and there was a collection in the retrorectus space which was drained with the help of a CT guided drain placement (negative suction). The mesh was not removed and the patient recovered.

The patient developing deep sepsis and managed by CT

guided drain placement developed recurrence. There was no mortality or flap necrosis in any of the patients included in the study.

### **Discussion:**

Incisional hernias are caused by the failure of abdominal wall musculature to heal adequately after abdominal surgery. This leaves a hole through which the viscera protrude. A surgical repair of hernia traditionally involves placing a drain to remove excess fluid in the subcutaneous plane. Drains may produce undesired results such as an increased risk of infection, pain and an increased hospital stay after surgery. We reviewed all the available trial evidence to see whether drains help or hinder recovery after operations for incisional hernia surgery. No trials except one compared patients who had drains inserted for incisional hernia repair against those who did not.<sup>(9)</sup> One trial compared two types of drain against each other and both models of drain performed similarly well. There is insufficient evidence to determine whether wound drains after incisional hernia repair are associated with better or worse outcomes. The raising of skin flaps in Rives Stoppa repair is minimal as compared to other repairs since the mesh is placed in a retromuscular planes. Even for an Onlay repair, Andre et al showed that the placement of a negative suction drain did not prevent complications like seroma and infections.<sup>(9)</sup> The recurrence rates for sublay repair has been in the range of 3-7%. Where the rates for inlay repair have been at 30% and for onlay is 16%.<sup>(1)</sup> This has been the only trial done comparing the two groups.

### **Conclusion:**

The placement of a negative suction drain in Rives Stoppa repair for incisional hernia confers no added advantage to patients. There is an increased morbidity observed in the form of increased duration of hospital. There were no differences in the incidence of all other complications but with a larger study group the superficial sepsis could be significantly increased in the patients with a drain. There should be more studies which compare the two groups.

### **Conflict of interest : None**

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