



Transverse abdominal release and posterior component separation in large incisional hernia

¹Dr. Akshata Hanamshetti, ²Dr. Vijay Kanase, ³Dr. Debasmita Ghosh

^{1,3}Resident, ²Professor, Department of General Surgery, Krishna Vishwa Vidyapeeth, Karad, Maharashtra, India

Corresponding author: Dr. Akshata Hanamshetti, Resident, Department of General Surgery, Krishna Vishwa Vidyapeeth, Karad, Maharashtra, India

Email: akshatahanamshetti@gmail.com

ABSTRACT

Background: Incisional ventral hernias are common complications of abdominal surgery. The present study was conducted to assess transverse abdominal release and posterior component separation in large incisional hernia.

Materials & Methods: 76 patients with incisional hernia of both genders were divided into 2 groups of 38 each. Group I patients were subjected to PCS-TAR using standard technique and group II (control) patients were subjected to conventional onlay mesh repair. Parameters such as wound complications (seroma, wound discharge/ gaping, flap necrosis), intra-abdominal pressure, duration of hospital stay, quality of life, and recurrence rate etc. was recorded.

Results: Group I had 18 males and 20 females and group II had 21 males and 17 females. The mean duration of surgery (mins) was <100 seen in 14 and 28 and >100 in 24 and 10. Defect size (cm) was 10 seen in 12 and 8, 11 in 10 and 11, 12 in 8 and 9, 13 in 5 and 6 and 14 cm in 3 and 4. Comorbidities observed were diabetes seen in 4 and 2, hypertension in 3 and 6 and both DM/ HTN in 7 and 8. Wound discharge was positive in 16 and 17, wound gaping was positive in 11 and 16, flap necrosis was positive in 0 and 9, intraabdominal pressure was <9 in 34 and 25 and >10 in 4 and 13 in group I and II respectively. The difference was significant (P< 0.05). The mean pain score was 32.5 in group I and 49.1 in group II, post- op hospital stay was 11.3 days in group I and 12.7 days in group II and recurrence rate was 1 in group I and 2 in group II. The difference was significant (P< 0.05).

Conclusion: Posterior component separation results in significant reduction in flap necrosis, intra-abdominal pressure, wound debridement and post op hospital stay.

Key words: Posterior component separation, intra-abdominal pressure, Incisional ventral hernias

Introduction

Incisional ventral hernias are common complications of abdominal surgery. Giant ventral hernias and complex abdominal wall reconstructions, on the other hand, are challenging tasks even for the most experienced hernia surgeons with no consensus as to which technique is the best suited for these procedures.¹ The Rives-Stoppa-Wantz technique is a proven technique for ventral hernia repairs, but because of the limitation related to the rectus sheath, it is not a viable option for giant hernias and wall defects. Unfavorable outcomes with traditional sutures and mesh techniques have led to the development of numerous new techniques. The classic (open anterior) component separation technique (ACST) was first reported by Albanese and later popularized by Ramirez as an autologous tissue repair technique.²

In 2012, Novitsky et al³ reported a novel approach to posterior component separation by transverse abdominis muscle release (TAR). The PCS-TAR is a modification of the Rives-Stoppa procedure which combines it with developing of a large retro-muscular/pre-peritoneal plane 2 and a consistent medial advancement of the abdominal wall musculature and accompanying fascia. By dividing the TA fibers, the lateral pull around the abdomen is released and the abdominal cavity is increased. The intraabdominal pressure (IAP) is also lowered by drawing the abdominal wall upward.⁴ Also, the force vector of the TA directly opposing the medialisation of the fascia is abolished.⁵ The result is a fascial advancement of 8 to 12 cm on each side which allows restoration without tension of the linea alba with improved abdominal core muscle function.⁶ The present study was conducted to assess transverse abdominal release and posterior component separation in large incisional hernia.

Materials & Methods

The present consisted of 76 patients with incisional hernia of both genders. All gave their written consent to participate in the study. Inclusion criteria was patient with large abdominal wall incisional or ventral hernia (defects larger than 10 cm in width, loss of domain); recurrent incisional hernias after intra-abdominal meshplasty; recurrences after anterior component separation. Exclusion criteria was recurrent hernia after Rives- stoppa repair and non- ventral hernias.

Data such as name, age, gender etc. was recorded. Patients were divided into 2 groups of 38 each. Group I patients were subjected to PCS-TAR using standard technique and group II (control) patients were subjected to conventional onlay mesh repair. Parameters such as wound complications (seroma, wound discharge/ gaping, flap necrosis), intra-abdominal pressure, duration of hospital stay, and recurrence rate etc. was recorded. Data thus obtained were subjected to statistical analysis. P value < 0.05 was considered significant.

Results

Table I Distribution of patients

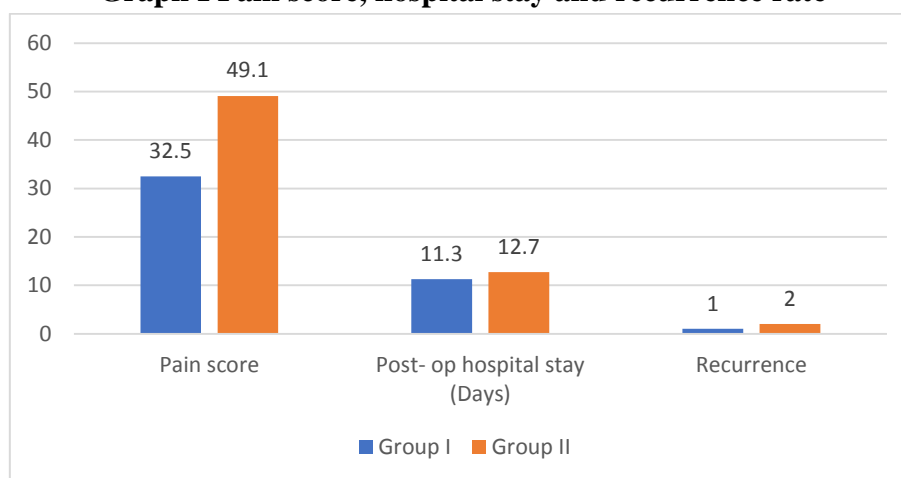
| Groups | Group I (38) | Group II (38) |
|--------|--------------|---------------|
| M:F | 18:20 | 21:17 |

Table I shows that group I had 18 males and 20 females and group II had 21 males and 17 females.

Table II Assessment of parameters

| Parameters | Variables | Group I | Group II | P value |
|----------------------------|--------------|---------|----------|---------|
| Duration of surgery (mins) | <100 | 14 | 28 | 0.02 |
| | >100 | 24 | 10 | |
| Defect size (cm) | 10 | 12 | 8 | 0.71 |
| | 11 | 10 | 11 | |
| | 12 | 8 | 9 | |
| | 13 | 5 | 6 | |
| | 14 | 3 | 4 | |
| Comorbidity | Diabetes | 4 | 2 | 0.05 |
| | Hypertension | 3 | 6 | |
| | DM/ HTN | 7 | 8 | |
| Wound discharge | Positive | 16 | 17 | |
| | Negative | 22 | 21 | |
| Wound gaping | Positive | 11 | 16 | 0.05 |
| | Negative | 27 | 22 | |
| Flap necrosis | Positive | 0 | 9 | 0.01 |
| | Negative | 38 | 29 | |
| Intraabdominal pressure | <9 | 34 | 25 | 0.02 |
| | >10 | 4 | 13 | |

Table II shows that mean duration of surgery (mins) was <100 seen in 14 and 28 and >100 in 24 and 10. Defect size (cm) was 10 seen in 12 and 8, 11 in 10 and 11, 12 in 8 and 9, 13 in 5 and 6 and 14 cm in 3 and 4. Comorbidities observed were diabetes seen in 4 and 2, hypertension in 3 and 6 and both DM/ HTN in 7 and 8. Wound discharge was positive in 16 and 17, wound gaping was positive in 11 and 16, flap necrosis was positive in 0 and 9, intraabdominal pressure was <9 in 34 and 25 and >10 in 4 and 13 in group I and II respectively. The difference was significant ($P < 0.05$).

Graph I Pain score, hospital stay and recurrence rate

Graph I shows that mean pain score was 32.5 in group I and 49.1 in group II, post- op hospital stay was 11.3 days in group I and 12.7 days in group II and recurrence rate was 1 in group I and 2 in group II. The difference was significant ($P < 0.05$).

Discussion

Ventral incisional hernia repair is one of the most commonly performed general surgical operations.^{7,8} The Rives-Stoppa-Wantz hernia repair technique, described in 1973, with the retro rectus abdominis muscle mesh placement, much larger than the hernial defect, is a proven and effective technique for open ventral hernia repairs. The major disadvantage of the technique is the limitation to the rectus compartment.⁹ Sometimes, in cases of giant ventral hernias with extensive tissue loss or even loss of domain, the Rives-Stoppa-Wantz technique is not sufficient to achieve a mesh overlap, a tension-free midline approximation, and restoration of the normal anatomy of the abdominal wall, and hence the recurrence risk is very high.¹⁰ The present study was conducted to assess transverse abdominal release and posterior component separation in large incisional hernia.

We found that group I had 18 males and 20 females and group II had 21 males and 17 females. Carbonell et al¹¹ reported a posterior CST (PCST) technique. It involves the incision of the PRS, after the separation from the rectus muscle, at its most lateral edge with access to the plane between the internal oblique and TAM. The fact that the plane between the internal oblique and TAM contains nerves and blood vessels leads to the main disadvantage of this technique - cutting of the intercostal nerves while advancing from the rectus abdominis to the lateral compartment, which may result in partial or complete rectus muscle paralysis.

We found that mean duration of surgery (mins) was <100 seen in 14 and 28 and >100 in 24 and 10. Defect size (cm) was 10 seen in 12 and 8, 11 in 10 and 11, 12 in 8 and 9, 13 in 5 and 6 and 14 cm in 3 and 4. Comorbidities observed were diabetes seen in 4 and 2, hypertension in 3 and 6 and both DM/ HTN in 7 and 8. Wound discharge was positive in 16 and 17, wound gaping was positive in 11 and 16, flap necrosis was positive in 0 and 9, intraabdominal pressure was <9 in 34 and 25 and >10 in 4 and 13 in group I and II respectively.

We found that mean pain score was 32.5 in group I and 49.1 in group II, post- op hospital stay was 11.3 days in group I and 12.7 days in group II and recurrence rate was 1 in group I and 2 in group II. Hodgkinson et al¹² in their study 7 studies showing 281 cases of PCSTAR for midline incisional hernia using a retromuscular mesh placement were included. 6 comparable studies describing 285 cases of OACS and retromuscular mesh placement were identified from the same search. Pooled analysis demonstrated a hernia recurrence rate of 5.7% (3.0-8.5) for PCSTAR and 9.5% for OACS. Comparative analysis demonstrated no significant difference between hernia recurrence rate ($p = 0.23$). The use of bridging mesh was not significantly reduced by the use of PCSTAR (3.1%) when compared to ACS (7.5%) ($p = 0.22$). No significant difference was found in wound complication rates between PCSTAR and OACS, respectively, 'superficial' 10.9 vs 21.6% ($p = 0.15$); and 'deep' 9.5 vs 12.7% ($p = 0.53$).

The limitation the study is small sample size.

Conclusion

Authors found that posterior component separation results in significant reduction in flap necrosis, intra-abdominal pressure, wound debridement and post op hospital stay.

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