



Research Article

EVALUATION OF OUTCOMES AND QOL IN PATIENTS UNDERGOING COMPONENT SEPARATION TECHNIQUE FOR VENTRAL HERNIA**Dr. Nancy Bharti, Dr. Zahur Hussain, Dr. Simran Sen and Dr. Santan Singh Bhagat**

Ward no 11 Anantapur chak near old bus stand kathua, J&K, India -184101

ARTICLE INFO**Article History:**Received 21st February, 2023Received in revised form 29th February, 2024Accepted 17th March, 2024Published online 28th March, 2024**Key words:**

Hernia, QoL, CCS.

ABSTRACT

Aim: To evaluate the outcomes and QOL in patients undergoing component separation technique for ventral hernia. **Material and Methods:** The present prospective study was conducted among 20 patients aged 18 to 60 years presenting to OPD/Emergency of Department of Surgery, Government Medical College, Jammu with complaints of ventral wall hernia with defect size of greater than 6 cm. The detailed history, clinical examination, relevant investigations were done prior to surgery. The patients were operated under general anesthesia after assessment by anesthetist and obtaining a detailed informed written consent. Perioperative complications, including surgical site occurrences (SSO) (seroma, wound infection, wound hematoma, and skin necrosis), reoperation, and mortality related to surgery during the first postoperative month were recorded. After hospital discharge, patients were during the hospital stay as well as 3 months after discharge. Recurrence was evaluated by clinical examination; and in case of doubt, an ultrasound or computed tomography was indicated. Carolinas Comfort Scale (CCS) scoring system was assessed. **Results:** Mean±SD of operative time (min) was 216.59±62.81 and mesh size (cm²) was 823.86±297.02. Mean ±SD value of hospital stays (in days) was 8.43±5.78. Mean ± SD value of pre and post operative pain was 2.53±1.17 & 2.88±0.93, movement limitation was 2.76±1.11 & 2.97 ±0.92 and overall quality of life was 2.65±1.04 & 2.69±0.98. **Conclusion:** While QOL is impacted by use of component separation and overall QOL improved significantly after ventral hernia repair when compared to preoperative QOL for component separation techniques studied. This reinforces the concept that ventral hernias should be repaired especially if the midline can be reapproximated as it may improve patient quality of life.

Copyright© The author(s) 2024. This is an open access article distributed under the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

INTRODUCTION

Ventral Hernia is defined as a protrusion of preperitoneal fat, peritoneum, and/or intraabdominal organs through the decussating fibers of the muscle sheaths in the anterior abdominal wall (Wantz GE, 1999)¹. The value of primary fascial closure in large ventral defects and loss of abdominal domain has been extensively documented in the surgical literature (Lowe JB III *et al.*, 2003)². Closure of the muscular abdominal wall helps improve overall patient function and quality of life (QOL) and reduce mesh-related complications and recurrence rates (Abrahamson J *et al.*, 1989)³. Myofascial advancement flaps or component separation (CS) was first described in 1977 by Mathes and Bostwick⁴ but was not popularized until 1990 by Ramirez *et al.*⁵. They demonstrated that the external oblique muscle can be separated from the internal oblique in a relatively avascular plane, and the rectus muscle with its overlying rectus fascia could be elevated from the posterior rectus sheath. Since then, multiple studies have demonstrated that CS is a safe and effective option for the repair of large ventral hernias (Chang EI *et al* 2007⁶; Ko JH *et al* 2009⁷).

Subsequently, CS alone was found to lead to very high recurrence rates, with studies demonstrating rates reaching 53% (Sailes FC *et al* 2010)⁸. Since then, reinforcement of the midline repair with mesh, either synthetic or biological, has gained popularity. In a clean, large VHR, rather than using the mesh as a “bridge,” CS with midline fascial closure over synthetic mesh reinforcement became fairly standard in the 18000 CSs performed annually in the United States from 2006 to 2008 (Venclauskas L *et al.*, 2010)⁹. This approach not only affords improved mechanical function of the abdominal wall but importantly also provides an excellent infection barrier between the mesh and the subcutaneous tissues. Although cellulitis and superficial wound complications are common, they are often easily treated as long as the overlying fascia remains intact and the mesh remains sterile.

With improvements in the understanding of the operative techniques for hernia repair a strong recommendation has been made to eliminate recurrence as the sole marker of a successful hernia repair and to include QOL as a major outcomes measure (Snyder CW *et al.*, 2011¹⁰; Heniford BT, 2012¹¹). Despite the major physical changes required in

*Corresponding author: **Dr. Nancy Bharti**

Ward no 11 Anantapur chak near old bus stand kathua, J&K, India -184101

performing a CS, including transecting muscle and the strongest fascial layer (external oblique) of the abdomen, important QOL issues in CS patients have not been addressed, including pain, movement, and activity limitations. Whereas studies suggest that CS patients may have persistent pain and decreased functionality postoperatively, (Clarke JM, 2010¹²) no QOL studies have addressed this topic specifically or in a comparative manner. Surgical-site infection, recurrence, length of stay, and mesh explantation are the most commonly utilised outcome measures in abdominal wall surgery, and these are improving, with many patients seeing excellent long-term results (Hawn MT *et al.*, 2010)¹³. However, a significant proportion of these operations are performed for symptom relief and to improve the quality of life (QOL).

Despite this, QOL outcomes are recorded far less frequently than surgeon centred outcomes and surgical-site outcomes form the basis of the majority of publications from centres of excellence. Such analysis would provide surgeons and patients with a better understanding of the appropriate use of CS, especially when weighing the risks and benefits during the decision-making and consent process.

So, the present study was undertaken to evaluate the outcomes and QOL in patients undergoing component separation technique for ventral hernia. The objective of the present study is to assess the surgical outcomes of patients undergoing component separation technique in terms of post operative pain, recurrence, wound infection, seroma/ hematoma formation and overall quality of life.

MATERIAL AND METHODS

The present prospective study was conducted among 20 patients aged 18 to 60 years presenting to OPD/Emergency of Department of Surgery, Government Medical College, Jammu with complaints of ventral wall hernia with defect size of greater than 6 cm. The study was carried over a period of 1 year w.e.f 1st November 2021 to 31st October 2022.

Inclusion criteria

Patients from age 18 to 60 years presenting to OPD/Emergency of Department of Surgery, Government Medical College, Jammu with complaints of ventral wall hernia with defect size of greater than 6 cm.

Exclusion Criteria

- Patients less than 18 years and more than 60 years of age
- Patients who have acute abdominal infections
- Patients who have deranged coagulation profile

Operative technique

We utilized a previously described open ventral hernia repair technique for elective repair of midline ventral hernias. We administered preoperative antibiotics and deep venous thrombosis prophylaxis. An incision was made depending on prior scars, wounds, integrity of skin or concomitant panniculectomy. The dissection was carried down to the hernia sac. Elevation of skin flaps inferiorly and superiorly was performed as needed for fascial exposure. The peritoneal cavity was entered through the hernia sac or linea alba. Adhesiolysis was performed with caution to avoid bowel injury. Most previously implanted mesh was removed but especially in cases of infected mesh. In clean cases where

mesh was significantly incorporated and removal would significantly disrupt the abdominal wall, it was left in place.

Following adhesiolysis, a preperitoneal plane was entered usually beginning inferiorly and progressing down into the space of Retzius and then progressing laterally developing preperitoneal flaps. Decision regarding further dissection would be made after measuring the size of the hernia defect. For smaller defects, a PRSR or TAR was chosen. The posterior rectus sheath was entered and dissected down to the lateral aspects where the neurovascular bundles could be identified. If a TAR was needed to reapproximate the midline fascia, the internal oblique's contribution to the posterior rectus sheath was then entered and the transversalis muscle was exposed, avoiding the nerves and vessels traveling medially.

The transversalis muscle was then transected along the length of the incision and dissected free to connect to the preperitoneal space laterally, superiorly and inferiorly. The transversalis fascia was sometimes left on the transversalis muscle and other times on the peritoneum, depending on the ease of dissection and integrity of the peritoneum. After complete preperitoneal dissection, the posterior rectus sheath and peritoneum was reapproximated with a running absorbable suture to completely cover the exposed abdominal viscera. Fenestrations in the peritoneum were closed primarily or patched with tongues of omentum, remains of the hernia sac or both. A mesh was then placed between the peritoneum and fascia, extending widely to allow for generous mesh-to-defect overlap.

METHODS

The detailed history, clinical examination, relevant investigations were done prior to surgery. The patients were operated under general anesthesia after assessment by anesthetist and obtaining a detailed informed written consent. Perioperative complications, including surgical site occurrences (SSO) (seroma, wound infection, wound hematoma, and skin necrosis), reoperation, and mortality related to surgery during the first postoperative month were recorded. After hospital discharge, patients were during the hospital stay as well as 3 months after discharge. Recurrence was evaluated by clinical examination; and in case of doubt, an ultrasound or computed tomography was indicated.

CCS

Carolinas Comfort Scale (CCS) scoring system was assessed. The CCS is a well documented and proven hernia specific questionnaire for patients undergoing hernia repair with mesh. It measures pain, movement limitations and the sensation of mesh for 8 different daily activities. These activities include lying down, bending over, sitting up, performing activities of daily living, coughing/breathing, walking, walking upstairs, and exercising. Each question is answered on a scale of 0 to 5, with 0 = no symptoms and 5 = disabling symptoms.

Data was collected and subjected to statistical analysis.

Statistical analysis

Data so collected was tabulated in an excel sheet, under the guidance of statistician. The means and standard deviations of the measurements per group were used for statistical analysis (SPSS 22.00 for windows; SPSS inc, Chicago, USA).

Difference between two groups was determined using t test and the level of significance was set at $p < 0.05$.

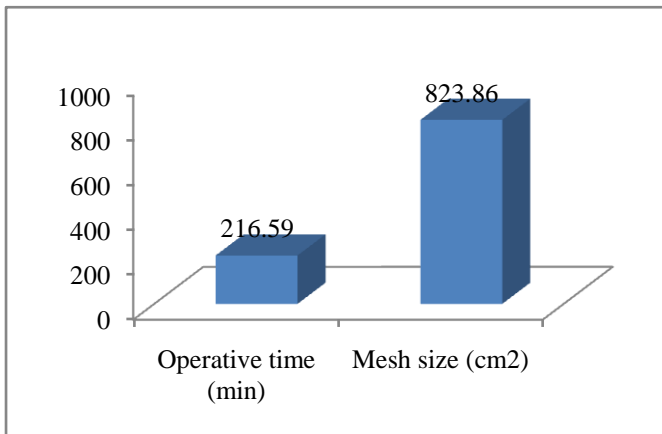
RESULTS

60% of subjects were female and 40% of subjects were male. Maximum (55%) subjects were in the age group of 51 to 60 years. 30% were in age group of 41-50 years, 10% were in 31 to 40 years and 5% were in age group of 18-30 years. 15% of subjects had hypertension and 10% had diabetes mellitus 40% of subjects had prior hernia repairs and 25% had subjects prior mesh used (Table 1).

Table 1 Profile of the study subjects

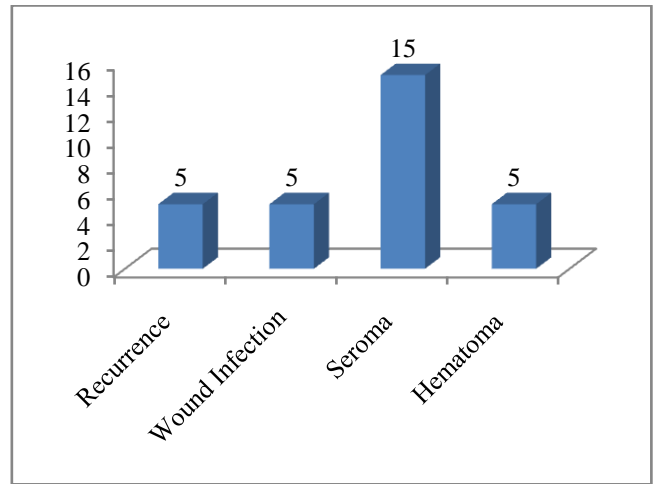
Gender	N=20	%
Male	8	40
Female	12	60
Age Group (in years)		
18-30	1	5
31-40	2	10
41-50	6	30
51-60	11	55
BMI (kg/m ²)		
Normal	4	20
Overweight	9	45
Obese	7	35
Co-morbidities		
Hypertension	3	15
Diabetes Mellitus	2	10
Past History		
Prior hernia repairs	8	40
Prior mesh used	5	25

Graph 1 shows operative characteristics among the study subjects. Mean±SD of operative time (min) was 216.59 ± 62.81 and mesh size (cm²) was 823.86 ± 297.02 . Mean ±SD value of hospital stays (in days) was 8.43 ± 5.78 .



Graph 1 Operative characteristics among the study subjects

Graph 2 shows complications among the study subjects. 15% of subjects had seroma, 5% had recurrence, 5% had wound infection and 5% had hematoma.



Graph 2 Complications among the study subjects

Mean ±SD value of post-operative pain among the study subjects was 6.83 ± 2.61 . Table 3 shows Pre and postoperative CCS comparison among the study subjects. Mean ± SD value of pre and post operative pain was 2.53 ± 1.17 & 2.88 ± 0.93 , movement limitation was 2.76 ± 1.11 & 2.97 ± 0.92 and overall quality of life was 2.65 ± 1.04 & 2.69 ± 0.98 .

Table 3 Pre and postoperative outcome among the study subjects

Carolinan Comfort Score (CCS)	Preoperative		Postoperative		p value
	Mean	SD	Mean	SD	
Pain	2.53	1.17	2.88	0.93	0.12
Movement limitation	2.76	1.11	2.97	0.92	0.29
Overall quality of life	2.65	1.04	2.69	0.98	0.81

DISCUSSION

Hernia repair has evolved dramatically over the past 40 years. Previously, recurrence after primary repair was an accepted and common complication until the advent of meshes, which drastically reduced recurrences from more than 50% down to as low as 2%. Obesity, abdominal soft-tissue infection, staged management of the prolonged open abdomen, and suboptimal mesh selection has led to larger and more complex abdominal defects, where fascial closure becomes difficult or impossible. As a result, patients with large defects or a loss of abdominal domain often receive a prosthetic bridge repair, which eliminates the gap in the abdominal wall but may result in a less functional or physiological abdominal wall. Lack of native, innervated tissue may lead to diminished mobility and can result in increased mesh sensation and impaired dynamics of the trunk while sitting, standing, bending, or performing normal activities of daily living. Biological grafts have also been utilized, but they have a high rate of recurrence resulting from mesh eventration (Lomanto D *et al*, 2006)¹⁴. Hence, the entitled study was carried out prospectively on the patients from age 18 to 60 years presenting to OPD/Emergency of Department of Surgery, Government Medical College, Jammu

with complaints of ventral wall hernia with defect size of greater than 6 cm.

60% of subjects were female and 40% of subjects were male in our study. 53.2% of subjects were female in a study conducted by Blair *et al*¹⁵ (2016) and concluded that female sex is one of the risk factor for hernia similar to our study. Patients were more commonly female in each group (54.1% vs 61.7%, P = .31) in a study done by Klima *et al* (2013)¹⁶.

Maximum (55%) subjects were in the age group of 51 to 60 years. 30% were in age group of 41-50 years, 10% were in 31 to 40 years and 5% were in age group of 18-30 years found in our study. Mean age of patients in a study done by Klima *et al*¹⁶ was 56.5 ± 13.0 vs 54.8 ± 12.3 years, P = .35 in different groups. Sanjay P *et al*¹⁷ in their study reported that hernia is associated with fifth decade of life.

Operative characteristics among the study subjects in our research showed mean±SD of operative time (min) was 216.59 ± 62.81 and mesh size (cm²) was 823.86±297.02. Operative times were longer in the EOR + PRSR group compared to TAR and PRSR (255 ± 89 min vs. 200 ± 45 min vs. 206 ± 65 min, p(0.0001) in a study done by Blair *et al*¹⁵. Purushotham B *et al*¹⁸ in their study stated that operating time of hernia repair varies considerably between surgeons and also between surgical centers and reduces with experience. In their study, most of the cases were completed within 62 minutes. Similarly Sreeharsha Korukonda *et al*¹⁹ in their study revealed that operating time was less than 1 hr in their group.

Mean ±SD value of hospital stays (in days) among subjects in our study was 8.43 ± 5.78. Mean hospital length of stay was 8.2 ± 7.1 and 8.8 ± 11.8 days in the CS group and OVHR groups, respectively (P = .69) in a research done by Kalima *et al*¹⁶. According to Sreeharsha Korukonda *et al*¹⁹, in group 1 mean postoperative hospital stay was 3.05 days with a standard deviation of 0.999. In group 2, mean postoperative hospital stay was 4.80 days with a standard deviation of 1.576.

Complications among the study subjects in our research showed 15% of subjects had seroma, 5% had recurrence, 5% had wound infection and 5% had hematoma. Complications, including mortality (1.2%), were frequent after both techniques (36.5%). The ACS technique was related to a significantly higher incidence of wound infection (P=0.05) and skin necrosis (P=0.0001) in a study done by Rodriguez *et al* (2021). Wound complications were the most common complications and were seen more frequently in the CS group. Interventions for seroma formation were the most common wound complication, with 14.9% in the CS group versus only 3.9% in the OVHR group (P = .005). Also, 8 CS patients (10.8%) developed some wound breakdown (defined as simple skin dehiscence) versus only 1 patient with standard repair (0.7%). Wound infections and hernia recurrences were similar between groups in a study done by Kalima *et al*¹⁶.

Pre and postoperative among the study subjects of our research showed Mean ± SD value of pre and post operative pain was 2.53±1.17 & 2.88±0.93, movement limitation was 2.76±1.11 & 2.97 ±0.92 and overall quality of life was 2.65±1.04 & 2.69±0.98. The results of the study was statistically significant with p value greater than 0.05. At short-term follow-up (3-4 weeks), all 3 scores were statistically similar to preoperative scores, with overall QOL scores of 2.62 ± 1.25 preoperatively versus 2.62 ± 0.88 by 1

month (P = 1.00). At long-term follow-up (average of 10.5 months; range = 7 months to 1 year), movement limitations and overall QOL scores had significantly improved in a study done by Kalima *et al*¹⁶.

CONCLUSION

While QOL is impacted by use of component separation and overall QOL improved significantly after ventral hernia repair when compared to preoperative QOL for component separation techniques studied. This reinforces the concept that ventral hernias should be repaired especially if the midline can be reapproximated as it may improve patient quality of life. Selection of appropriate component separation technique is multifactorial. Size of defect, integrity of the abdominal wall and number of previous repairs are main influences on technique choice. Further and larger multicenter studies are necessary to better define the long-term impact of component separation techniques for patients undergoing open ventral hernia repair.

References

1. Wantz, G. E. (1999). Abdominal wall hernias. In S. I. Schwartz, G. T. Shires, & F. C. Spencer (Eds.), *Principles of Surgery* (7th ed., pp. 1585-1611). McGraw-Hill.
2. Lowe, J. B., Garza, J. R., Bowman, J. L., Rohrich, R. J., & Strodel, W. E. (2000). Endoscopically assisted "components separation" for closure of abdominal wall defects. *Plastic and Reconstructive Surgery*, 105(2), 720-729.
3. Abrahamson, J., & Eldar, S. (1989). Abdominal incision. *Lancet*, 1, 847.
4. Mathes, S. J., & Bostwick III, J. (1977). A rectus abdominis myocutaneous flap to reconstruct abdominal wall defects. *British Journal of Plastic Surgery*, 30, 282-283.
5. Ramirez, O. M., Ruas, E., & Dellon, A. L. (1990). "Components separation" method for closure of abdominal-wall defects: An anatomic and clinical study. *Plastic and Reconstructive Surgery*, 86(3), 519-526.
6. Chang, E. I., Foster, R. D., Hansen, S. L., Jazayeri, L., & Patti, M. G. (2007). Autologous tissue reconstruction of ventral hernias in morbidly obese patients. *Archives of Surgery*, 142, 746-749.
7. Ko, J. H., Wang, E. C., Salvay, D. M., Paul, B. C., & Dumanian, G. A. (2009). Abdominal wall reconstruction: Lessons learned from 200 "components separation" procedures. *Archives of Surgery*, 144, 1047-1055.
8. Sailes, F. C., Walls, J., Guelig, D., *et al.* (2010). Synthetic and biological mesh in component separation: A 10-year single institution review. *Annals of Plastic Surgery*, 64, 696-698.
9. Venclauskas, L., Maleckas, A., & Kiudelis, M. (2010). One-year follow-up after incisional hernia treatment: Results of a prospective randomized study. *Hernia*, 14, 575-582.
10. Snyder, C. W., Graham, L. A., Vick, C. C., Gray, S. H., Finan, K. R., & Hawn, M. T. (2011). Patient satisfaction, chronic pain, and quality of life after elective incisional hernia repair: Effects of recurrence and repair technique. *Hernia*, 15, 123-129.

11. Heniford, B. T. (2012, March 28–31). Quality of life: The next paradigm in hernia repair [Presidential address]. American & European Hernia Society Meeting, New York City, NY.
12. Clarke, J. M. (2010). Incisional hernia repair by fascial component separation: Results in 128 cases and evolution of technique. *American Journal of Surgery*, 200, 2-8.
13. Hawn, M. T., Snyder, C. W., & Graham, L. A. (2010). Long-term follow-up of technical outcomes for incisional hernia repair. *Journal of the American College of Surgeons*, 210, 648–655.
14. Lomanto, D., Iyer, S. G., Shabbir, A., & Cheah, W. K. (2006). Laparoscopic versus open ventral hernia mesh repair: A prospective study. *Surgical Endoscopy*, 20, 1030–1035.
15. Blair, L. J., Cox, T. C., Huntington, C. R., *et al.* (2017). The effect of component separation technique on quality of life (QOL) and surgical outcomes in complex open ventral hernia repair (OVHR). *Surgical Endoscopy*, 31(9), 3539–3546.
16. Klima, D. A., Tsirlina, V. B., Belyansky, I., *et al.* (2014). Quality of life following component separation versus standard open ventral hernia repair for large hernias. *Surgical Innovation*, 21(2), 147-154.
17. Sanjay, P., Leaver, H., Shaikh, I., & Woodward, A. (2011). Lichtenstein hernia repair under different anaesthetic techniques with special emphasis on outcomes in older people. *Australasian Journal on Ageing*, 30(2), 93-97.
18. Purushotham, B., & Madhu, S. (2015). Comparative study between laparoscopic and open repair of umbilical and paraumbilical hernia. *International Surgery Journal*, 2(2), 204–213.
19. Korukonda, S., Amaranathan, A., & Ramakrishnaiah, V. P. (2017). Laparoscopic versus open repair of Para-umbilical Hernia-A prospective comparative study of short term outcomes. *Journal of Clinical and Diagnostic Research: JCDR*, 11(8), PC22.

How to cite this article:

Nancy Bharti, Zahur Hussain, Simran Sen and Santan Singh Bhagat. (2024). Evaluation of Outcomes and QOL In Patients Undergoing Component Separation Technique for Ventral Hernia. *International Journal of Current Advanced Research*.13(03), pp.2985-2989.
