

Comparison of open anterior component separation versus endoscopic anterior component separation technique for ventral midline incisional hernia at tertiary care teaching hospital in central India

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Abstract

Background: ventral hernia a known complication after abdominal surgery, ventral hernia repair can be done by open anterior component separation as well as endoscopic anterior component separation technique ; studies doing comparison to prove superiority one over other are limited. Hence this study was conducted with objective of Comparison of open anterior component separation versus endoscopic anterior component separation technique for ventral midline incisional hernia in tertiary care teaching hospital Govt Medical College, Nagpur in central India. **Material and methods:** Study design was a non randomised experimental study. A total 24 patients underwent the ventral midline incisional hernia repair in the study period of 28 months. Out of which 09 cases underwent endoscopic repair and 15 cases underwent open anterior component separation of ventral incisional hernia repair. Final data was tabulated and statistics (mean, t-test-values) were used to compare both technique. **Discussion:** Out of 24 patients, higher blood loss in open anterior component separation technique (p-0.013) while endoscopic anterior component separation technique requires significantly more operative time (p-0.007), there was no significant difference in duration of drain removal (p-0.964). Mean post operative stay was comparatively lesser in endoscopic repair technique (p-0.015) with lesser pain in endoscopic repair method. **Summary and conclusion:** Endoscopic anterior component separation requires more duration but less Intra operative blood loss, less post operative pain. Post operative complications are minimal with the endoscopic component separation technique. Less post operative complications rates shortens the post operative hospital stay than open anterior component separation technique. Thus endoscopic anterior component separation technique must be the preferred surgery over open anterior component separation techniques.

Key Words: open anterior, endoscopic anterior.

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INTRODUCTION

An incisional hernia is defined as a postoperative protrusion of abdominal viscera through a defect in

abdominal wall, into the subcutaneous tissue, enveloped in a serous sac which is in continuity with the peritoneum. It is known complication after abdominal surgery accounting 11 to 18.7% of patients within the period of 10 years after surgery.¹ Despite advances in surgery, correction of ventral midline incisional hernia continues to be problematic with the recurrence rates of 5% to 63% depending on various types of repair used.² Occurrence of an incisional hernia can be related to an error in surgical technique but is generally a multifactorial situation, often the result of deterioration of patient's condition; especially local wound disturbances eg. post operative wound infection. In 1990 Oscar Ramirez³ published his preliminary results of a novel non-mesh surgical technique for closure of large abdominal wall defects. He

described good results by using the so called component separation method (CSM): a non-mesh functional repair in which the external and internal oblique abdominal muscles are separated after exposure through a midline laparotomy. By exclusive incision of the external aponeurosis, a separation of the external and internal oblique muscles can be released as far as the posterior axillary line. This will result in an impressive medial translation of the rectus abdominus, still connected to the internal oblique and transverse oblique muscle.⁴ As a consequence, large abdominal wall defects can generally be closed primarily with this tension relaxing procedure without transposition of muscular flap or the use of prosthetic mesh, while restoring a circumferential coverage of the abdominal cavity.⁵ This can be done by open as well as endoscopic approach; superiority of one of this technique has not been evaluated in study area. Hence this study was conducted with objective of Comparison of open anterior component separation versus endoscopic anterior component separation technique for ventral midline incisional hernia in tertiary care teaching hospital Govt Medical College, Nagpur in central India.

MATERIAL AND METHODS

Study was conducted at tertiary care teaching hospital Govt Medical College, Nagpur where most of the ventral midline incisional hernia (after previous operative intervention) referred from private as well as government health care system comes. Study design was a non randomised experimental study carried out from July 2014 to November 2016. Study population comprises of all the asymptomatic and uncomplicated patients of ventral midline incisional hernia coming to tertiary care teaching hospital. All symptomatic but uncomplicated cases of ventral midline incisional hernia with defect size more than 50 cm² and width of defect more than 5 cm with valid proper consent were included. Complicated hernia (obstructed or strangulated), previous colostomised, and non consenting patients were excluded. A total 24 patients underwent the ventral midline incisional hernia repair in the study period of 28 months. Out of which 10 cases underwent laparoscopic repair and 14 cases underwent open anterior component separation repair of ventral incisional hernia repair. Out of 10 endoscopic 1 case was converted to open procedure due to dense adhesions. All of the patients were admitted in different surgical units. All details information was recorded in the pre designed and pre tested proforma of the study of each case. The patients related factors namely age, sex, multi parity, obesity, cough/COPD, constipation, prostatism, diabetes mellitus, hypertension steroid therapy, consumption of tobacco and alcohol, past

surgical history, its nature, post operative period, onset and progress of present hernia to find out any etiological factors for development of incisional hernia taken in details. After all general evaluation and fitness we had done component separation technique for ventral midline incisional hernia by open and endoscopic approach. There were no specific criteria to choose methods of component separation technique either open or endoscopic. Special emphasis given to compare -Duration of operative procedure, Average blood loss during procedure, Pain score, Immediate and late complications, Drain removal time period, Total hospital stay in days. Duration of operative procedure expressed in minutes. Blood loss expressed in millilitre. Categorical variables expressed in percentage and quantities were expressed in mean and standard deviation (SD). Values were considered significant when p value < 0.05. Mean were compared by using independent t-test and categorical variables were compared by x²-test. Data analysis was done by entering data in Microsoft excel and analysed by using EPI INFO 7.

RESULTS

The mean duration for endoscopic ventral incisional hernia repair was 218(±69.9) minutes with open anterior component separation technique mean was 162 (± 21.11) minutes having p value 0.007 suggestive of there was significant higher time taken for endoscopic repair method. Average blood loss in open repair method was 245(±45) ml and in endoscopic repair method it was 197(±36) ml with p value 0.013 signifies higher blood loss in open repair method. After comparing means of both open and endoscopic repair methods there were no significant difference in duration of drain removal (p-0.964). Hospital stay for open repair (12.2(±1.93)) with compare to endoscopic repair (10.22(±1.48)) was significantly higher (p-0.015).

Table 1: Comparison of Duration of surgery, average blood loss, drain removal and post operative hospital stay

Variables	Open Repair Method	Endoscopic Repair Method	T-Test Value	P-Value
Duration Of Surgery In Min. (Mean± Sd)	162 (±21.11)	218(±69.9)	2.97	0.007
Average Blood Loss In ml. (Mean± Sd)	245(±45)	197(±36)	2.67	0.013
Post Operative Drain Removal In Days (Mean± Sd)	6.13(±1.24)	6.11(±1.05)	0.044	0.964
Post Operative Hospital Stay. (Mean± Sd)	12.2(±1.93)	10.22(±1.48)	2.63	0.015

Table 2: Pain scale of post operative pain

Pain Scale	Open Repair Method	Endoscopic Repair Method	χ^2 Test	P Value
0 (No Pain)	0	0		
1-3 (Mild Pain)	3	6		
4-6 (Mod Pain)	10	2		
7-10 (Severe Pain)	2	1		
Total	15	9	5.54	0.064

Pain scale of post operative pain after applying χ^2 test was 5.54 with p value of 0.064 suggestive of there was no significant difference in pain perceived by patient by both methods.

Table 3: Post operative complications in study subjects

Complications	Open Repair Method (Out of 15)	Endoscopic Repair Method (Out of 09)
Fever	3 (20%)	1(11.11%)
Seroma	2 (13.3%)	0
Prolonged Ileus	4 (26.67%)	3(33.33%)
Wound infection (SSI)	1 (6.67%)	0
Flap necrosis	0	0
Recurrence	1 (6.67%)	0

In present study prolonged ileus is most common complication followed by fever and seroma at the site of operative intervention.

DISCUSSION

In present study mean duration of operation of most of the patients was range between 162 (\pm 21.11) minutes for open and 218(\pm 69.9) minutes for endoscopic method. on comparison endoscopic component separation technique requires significantly more duration (p-0.007) than open anterior component separation method as 25% of total patients requires 180-200 minutes; possibly due to handling of endoscopic instruments, port placements and time required for creation of space between external and internal oblique muscle, which can be improved with experience. In present study average mean blood loss in maximum number of patients done by open method was 245(\pm 45) ml while in endoscopic repair method it is 197(\pm 36) ml signifies higher blood loss compared to endoscopic repair method (p-0.013). 10 patients (41.6%) developed moderate pain in open surgical approach while only 6 (25%) developed mild pain in endoscopic component separation technique clearly showing endoscopic methods post operative course was less painful. In post operative course ileus was the main complication in both type of surgeries but endoscopic method amounting to 33.33% higher than open method (26.67%), fever was more common with open surgical technique(20%), 2 patient who underwent open surgical technique developed seroma at surgical site while 1 developed surgical site infection and one patient recurs

after open method. This findings are similar with other studies⁶. Drain removal done after 4 days it was earlier that is before 6 days in 25% patients done endoscopically with mean duration 6.11(\pm 1.05) days while it 6.13(\pm 1.24) days in open procedure. There was no significant difference in duration of drain removal (p-0.964). The duration of post operative hospital stay was 13 days (range 9-20 days). 14 patients (58%) had stay up to 11 days while 10 patients (42%) were stayed more than 11 days up to 20 days. Mean post operative stay was comparatively lesser in endoscopic repair technique i.e. 10.22(\pm 1.48) days as compared to open repair method with 12.2(\pm 1.93) days which are significantly more than endoscopic repair technique (p-0.015). Prolong postoperative stay in open repair technique is probably due to postoperative complications.

CONCLUSION

Intra operative blood loss is less in endoscopic component separation technique as compare to open technique but requires more duration of operation compare to open anterior component separation technique. Post operative pain is minimal with endoscopic component separation. Post operative complications are minimal with the endoscopic component separation technique. Less post operative complications rates shortens the post operative hospital stay than open component separation technique. Thus endoscopic component separation technique must be the preferred surgery over open anterior separation techniques for ventral midline incisional hernia as there is less average blood loss, minimal chance of post operative complications, minimal pain, and decreased length of hospital stay with less readmission.

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