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Original Article

Comparison of Laparoscopic Total Extra Peritoneal (TEP)Techniques versus Transabdominal Preperitoneal (TAPP) Technique for Inguinal Hernia Repair

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Abstract

Background: To Compare laparoscopic total extra peritoneal (TEP)techniques with transabdominal preperitoneal (TAPP) technique for inguinal hernia repair

Methods: In this randomized controlled trial 120 patients undergoing herniorraphy were divided into two groups .Sixty patients into Laparoscopic Total Extra Peritoneal (TEP)Techniques group and 60 into Transabdominal Preperitoneal (TAPP) Technique group. TAPP required access to the peritoneal cavity with placement of a mesh through a peritoneal incision. Mesh was placed in the preperitoneal space covering all potential hernias sites in the inguinal region leaving it between the preperitoneal tissues and the abdominal wall where it becomes incorporated by fibrous tissue. In TAPP pneumo-peritoneum was created by open technique, circular incision was given on peritoneum. Peritoneum was lifted, proline light weight mesh was placed, and peritoneum was stitched with continued suture. In TEP, the peritoneal cavity was not entered, infra-umbilical trocar was inserted in the preperitoneal space, space was created with camera, and mesh was used to seal the hernia from outside the peritoneum. Both techniques were compared in terms of mean operative time, conversion to open procedure, post operative pain, length of hospital stay, port site infection, mesh infection, return to daily activity, deep infection and recurrence.All patients were followed for a period of 1 year

Results: Mean operative time in TEP repair was 45.1 ± 3.54 minutes, whereas in TAPP repair was 70 ± 6.01 minutes (p=0.000). Five laparoscopic TEP were converted to open repair due to major breach in peritoneum. In TEP group 40 patients complained mild pain. In TAPP group 25 patients complained mild pain and 30 complained moderate pain(p= 0.015). Average requirement of analgesia in TEP group was 2 doses of I/M dicloran whereas average requirement of analgesia in TAPP group was 3 doses. Length of hospital stay in both groups was one day. In TEP group no patient developed port site infection whereas 1 patient in TAPP group developed port site infection. One patient developed mesh infection in each group. In TEP group return to daily activity was 4 days where as in TAPP group return to daily activity was 5 days. No patient developed deep site infection in both groups. There was no recurrence in one year follow up.

Conclusion: TEP has advantage of short operative time and less post operative pain and therefore less requirement of analgesia and early return to daily activity, where as TAPP is superior, there being less chance of conversion

Key Words: TEP, TAPP, inguinal Hernia, laparoscopic complications

Introduction

Inguinal hernia repair is most commonly performed elective surgery procedure. There is more trend towards minimal invasive surgery. Most commonly performed laparoscopic inguinal hernia repair procedures are Laparoscopic Total Extra Peritoneal (TEP)Techniques and Trans-abdominal Preperitoneal (TAPP) Technique . Both have different advantages over other. TEP being extra peritoneal repair is comparatively safe and is associated with less visceral injuries where as TAPP on the other hand offers good visualization of and easy learning curve but is associated with high risk of visceral injuries. Surgical history of inguinal hernia repair dates back to ancient Egypt. Marcy probably the first person who did first documented inguinal hernia repair.[1,2] Majority (75%) of all abdominal wall hernias occur in the groin.[2] Laparoscopy has revolutionized the general surgery, now everyone is keen towards key hole surgery, giving cosmetically small scars to patient. Laparoscopic approach is considered more difficult than open approach.[3] Even though it is more difficult but more and more surgeons advocate laparoscopic approach because it warrants smooth expedite recovery.[4] The choice of laparoscopic procedure is controversial. In TAPP and totally extra peritoneal (TEP) mesh is placed via key hole.[3] Both have different

advantages and disadvantages.TEP is considered safe but it is technically more difficult than TAPP.[5] In TEP there is less risk of damage to the internal organs and as peritoneal cavity is not entered the risk of adhesion formation leading to intestinal obstruction is also low, which has been linked to TAPP.[3] On the other hand TAPP is associated with longer hospital stay as compared to TEP. [6] In TAPP peritoneum is opened so it is associated with increased risk of visceral injury and recurrence.[3] In TEP the biggest problem is conversion to open surgery as this surgery mainly relies on extra peritoneal dissection, so iatrogenic injury to peritoneum results in conversion to open procedure. Conversion to open surgery is not a problem of TAPP because in TAPP pneumo-peritoneum is deliberately created and mesh is placed extraperitoneally through an incision in the peritoneum[3]. TEP as compared to TAPP has a long learning curve and it requires more skill.[7] There are few studies in the literature which compared TEP with TAPP but results of these studies are equivocal.

Patients and Methods

This randomized controlled trial was conducted over a period of 3 years from January 2010 to December 2012 in Surgical Unit II Holy Family Hospital, Rawalpindi. In this study, two groups were made each having 60 patients. All patients were selected by simple convenient sampling. Inclusion criteria was, male patients with age 20 to 50 years with inguinal hernia confined to inguinal canal (bubonocele) with no other co morbidity or previous surgery, and without any other general contraindication for laparoscopic surgery. All patients were diagnosed by clinical examination and ultrasound inguinoscrotal region. TAPP requires access to the peritoneal cavity with placement of a mesh through a peritoneal incision.Mesh is placed in the preperitoneal space covering all potential hernias sites in the inguinal region leaving it between the preperitoneal tissues and the abdominal wall where it becomes incorporated by fibrous tissue. In TAPP pneumo-peritoneum was created by open technique, circular incision was given on peritoneum. Peritoneum was lifted, proline light weight mesh was placed, and peritoneum was stitched with continuous suture. In TEP, the peritoneal cavity was not entered, infraumbilical trocar was inserted in the preperitoneal space, space was created with camera, and mesh was used to seal the hernia from outside the peritoneum. Both techniques were compared in terms of mean operative time, conversion to open procedure, post operative pain, length of hospital stay, port site infection, mesh infection, return to daily activity, deep infection and recurrence. Pain wa s measured by WHO VAS at 24 hours. All patients were followed for a period of 1 year for recurrence. Data was analyzed by SPSS 17.

Results

There were 60 patients in each group. The mean operative time in totally extra peritoneal (TEP) repair was 45.1±3.54 minutes, whereas in transabdominal preperitoneal (TAPP) repair was 70±6.01 minutes (p-value = 0.000) (Table 1). Five Laparoscopic TEP were converted to open repair due to major breach in peritoneum. In TEP group 40 patients complained mild pain, 15 patients complained moderate pain and 5 patients complained severe pain. In TAPP group 25 patients complained of mild pain, 30 complained moderate pain and 5 patients complained severe pain (p-value = 0.015)(Table 2). Average requirement of analgesia in TEP group was 2 doses of I/M dicloran whereas Average requirement of analgesia in TAPP group was 3 doses. Length of hospital stay in both groups was one day. In TEP group no patient developed port site infection where as 1 patient in TAPP group developed port site infection. One patient developed mesh infection in each group. In TEP group return to daily activity was 4 days where as in TAPP group return to daily activity was 5 days. No patient developed deep site infection in both groups**.** There was no recurrence in one year follow up.

Table 1:Comparison of pain in both the groups

	TEP	TAPP	p-value
Mild pain	40	25	0.015
Moderate pain	15	30	
Severe pain	05	15	

Table 2:Comparison of mean operative time

	TEP	TAPP	P-value
Mean Operative Time (minutes)	45.1 ± 3.54	70 ± 6.01	0.000

Discussion

In this study, the mean operative time in TEP was 45.1 ± 3.54 minutes which is comparable to mean operative time of 55 ± 22.8 found by Mustafa et.al. [7] Whereas in TAPP mean operative time was 70 ± 6.01 minutes which is comparable to mean operative time 90 minutes studied by Pironi D. et.al.[8] The conversion rate in TEP is variable.[9-12,14,15] Some studies revealed higher conversion rate in TEP group, but a meticulous

approach can prevent the conversion.[10-12,15] However it was observed that in the large case series TAPP and TEP had very similar conversion rates at 0.24% (Baca et al 2000) and 0.23% (Tamme et al 2003) respectively.[9,14] In our study we observed that 5 patients i.e 8% laparoscopic TEP were converted to open due to breach in peritoneum which is comparable with documented literature.[7] No conversion to open occured in TAPP group which is comparable to other studies. [9-,11] In TEP group fewer patients complained of pain as compared to TAPP group which is comparable to Lepere et al 2000.[6] According to study by Baca et al (2000) TEP group has a shorter hospital stay as compared to TAPP group. [9] Length of hospital stay in both groups was one day. In TEP group no patient developed port site infection where as in TAPP group 1 patient developed port site infection, and it is comparable to Bacca et al (2000) and Cohen et al (1998). [9,10] The most feared complication in inguinal hernia surgery is mesh infection and it will result in mesh removal which significantly increases morbidity and hospital stay.[9-16] In our study 1 patient developed mesh infection in each group, mesh was removed by open technique in both patients. Patient returned to daily activity at 4th day in TEP group and at 5th day in TAPP group, which is comparable to Bacca (2000) and Lepere (2000).[5,9] In the comparative studies, three reported no deep infections. [11,12,15] Whilst one reported rates of 0% and 0.2% for TEP and TAPP respectively.[16] Deep infection for TAPP was low in the two case series.[9,13] Tamme (2003) did not indicate any difference in deep infection between TAPP and TEP. [14] In our study no patient developed intra peritoneal collection or deep site infection. There was no recurrence observed in both groups in one year follow up.

Conclusion

TEP has advantage of short operative time and less post operative pain and therefore less requirement of analgesia and early return to daily activity, whereas TAPP is superior, there being less chance of conversion.

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