

RESEARCH ARTICLE

Open Access

Transabdominal pre-peritoneal mesh in inguinal hernia repair in elderly: end point of our experience

Alessia MDG Ferrarese^{*}, Stefano Enrico[†], Mario Solej[†], Alessandro Falcone[†], Silvia Catalano[†], Enrico Gibin[†], Silvia Marola[†], Alessandra Surace[†], Valter Martino[†]

From 26th National Congress of the Italian Society of Geriatric Surgery
Naples, Italy. 19-22 June 2013

Abstract

Background: Aim of this study is to present our standardized laparoscopic transabdominal preperitoneal hernia repair (TAPP) technique, and to study our experience in the elderly as far as concerns preoperative and postoperative variables.

Methods: We described our standardized TAPP technique according with Stuttgart technique [1], and we evaluated our team's experience in TAPP inguinal hernia repair in elderly (> 65 yrs) and in young patients (< 65 yrs).

Results: We retrospectively reviewed our Surgery Division's experience about TAPP; we included in our study 185 patients. The sample was subdivided in two groups: TAPP Group (< 65 years patients) and TAPPe Group (> 65 years patients). TAPP Group was composed by 154 patients and TAPPe Group of 31 patients. According with literature, in this subgroup recurrence rate (3,2%), early and delayed complications and mean operative time (86 min). There were no major vascular or intestinal complications. At the moment follow-up is 31 months. There were no incisional hernias on umbilical trocar. Mean satisfaction rate was excellent also in elderly patients.

Conclusions: According with literature, in our experience TAPP technique is a safe and feasible procedure, even in elderly patients.

Background

Mini-invasive approach in surgery ensures better aesthetic results, faster return to work and a lesser post-operative pain, also in elderly patients [1,2,5,7].

Aim of this study is to evaluate the feasibility of our technique in the elderly, as far as concerns preoperative and postoperative variables.

Methods

Our work is a retrospective study conducted at University Section of General Surgery in "San Luigi Gonzaga" Hospital, Orbassano (Torino). At first we described our standardized TAPP technique.

We reviewed our experience from July 2007 to December 2012 about TAPP in elderly patients (> 65 yrs - TAPPe Group) and in young patients (< 65 yrs - TAPP Group). In our division of General Surgery the first TAPP was performed on 02/05/2007. In TAPP and TAPPe Groups were excluded patients with: important comorbidities, severe chronic obstructive pulmonary disease (COPD), previous retinal detachment, glaucoma. We also excluded patients who refused general anesthesia. We didn't excluded patients with previous abdominal surgery.

All procedures were conducted by three surgeons with more than 15 years laparoscopic experience.

We first used polypropylene high-weight meshes [3] fixed with absorbable clips, then we started to use polypropylene low-weight meshes fixed with fibrin glue [4,13] and finally we started to use self-locking Polyester meshes [12]: currently 30 TAPP (6 in elderly) were performed using this mesh, in these cases without any fixation device.

* Correspondence: alessia.ferrarese@gmail.com

† Contributed equally

University of Turin - Department of Oncology - School of Medicine - Teaching Hospital "San Luigi Gonzaga" - Section of General Surgery - Orbassano - Turin, Italy

Following literature pattern, complications were divided into: recurrence (early and late), early minor complications (minor vascular lesions, seroma, scrotal hematoma), early major complications (major vascular injury, bladder injury, visceral injury, umbilical cord injury), late minor complications (chronic pain) and late major complications (incisional hernia, mesh infection, mesh rejection, intra-abdominal infection, exitus).

We finally asked patients to express an opinion from 0 to 4 as a score for their satisfaction about the TAPP procedure received.

Surgical technique [1]

- Pneumoperitoneum in left hypochondrium by Veress needle, and access in the umbilical region by Hasson reusable trocar. Intra-abdominal pressure is maintained at 12 mmHg. Placing a disposable 5/12 mm operating trocar in the right side and a reusable 5 mm trocar in the left hip. Peritoneal incision from the anterior superior iliac spine to the median ligament. Medial dissection up to discover Cooper's ligament. Dissection on the upper side of Psoas muscle. Median dissection till complete reduction of the hernia sac and of the pre-lipomatous formation in the abdomen
- In case of bilateral defects we find it useful to proceed to the contralateral preparation before mesh placement, and we prefer to prepare two separate preperitoneal pockets
- Mesh preparation and its shaping of approximately 13 × 11 cm in the medial part, 8-9 cm in the lateral part, with median notch for the umbilical cord
- Mesh introduction and its placement in the preperitoneal pocket
- Closure of the peritoneal flap by continuous suture with Prolene 2/0 absorbable, secured with clips, after eversion of the sac in the abdomen.

Results

From January 2007 to December 2012 in our University General Surgery division 730 hernioplasty were performed, 492 with open approach and 185 with laparoscopic approach.

Laparoscopic Group was divided into two subgroups according to the age of patients in: TAPP Group with <65 years patient (133 M, 21 F - average age 57 aa - mean BMI 26) and the TAPPe Group with >65 Years patients (29 M, 2 F - average age 69 years - mean BMI 25) (Table 1).

At the time of surgery, in TAPP Group 76 defects were unilateral, 25 bilateral and 53 were recurrent hernias; in TAPPe Group 23 were unilateral hernias, 3 were bilateral and 5 were recurrent hernias (Table 2). Most defects were left hernias, in both samples. At the moment the mean follow-up is 31 months. Mean operative time was 92 minutes in TAPP group and 86 minutes in TAPPe

Table 1 Demographic data

	TAPP Group	TAPPe Group
Age	57 (27-87)	69 (65-87)
BMI	26	25
Sex M/F	133/ 21 (82,05% - 17,95%)	29/2 (93,5% - 6,5%)

Table 2 Characteristics of defects

	TAPP Group	TAPPe Group
Unilateral hernia	76/154 (49,3%)	23/31 (74,2%)
Bilateral hernia	53/154 (34,4%)	5/31 (16,1%)
Recurrent hernia	25/154 (16,2%)	3/31 (9,7%)

Group (Table 3). Anatomical features were satisfactory in 83% of cases, pain's triangle and disaster's triangle were well identified in all cases.

There were no major vascular injury, visceral injury or bladder injury in any case.

There were no wound infections or mesh infections in either group.

In TAPP Group 57 cases were treated using polypropylene mesh fixed with absorbable clips, 56 cases using polypropylene mesh fixed with biological glue and 24 cases using a self-locking mesh. In TAPPe Group 3 cases were treated using polypropylene mesh fixed with absorbable clips, 22 cases using polypropylene mesh secured with biological glue and 6 cases using a self-locking mesh. We never used non-absorbable metal tacks (Table 4).

Observed complications are as follows (Table 5,6): in TAPP group there were 4 early recurrent hernias and 2 late recurrent hernias, 1 epigastric lesion, 8 seroma and 4 chronic pain. In TAPPe Group we described only one early recurrent hernia and 2 seromas.

There was no mortality. The mean patients hospital stay was: 1.5 days in TAPP Group and 1.3 days in TAPPe Group. All patients were satisfied about laparoscopic procedure (Table 7).

Conclusions

Laparoscopic treatment of inguinal hernias is a difficult procedure that requires an adequate learning curve [1]. In our experience, operative time and hospital stay appear to be acceptable and in accord with the experience of most centres.

Short-and long-term results of the technique in terms of perioperative minor complications, post-operative pain and morbidity are in agreement with literature [7-11].

According to literature, satisfaction of patients who underwent laparoscopic procedure in our TAPP experience was excellent.

Table 3 Intraoperative variables

	Total TAPP Group (TAPP)	Elderly TAPP Group (TAPPe)
Mean operative time (min)	92	86
Escical lesion	0	0
Majior vascular lesions	0	0
Minor vascular lesion	1	0
Nerve injury	4/154 (2,6%)	0
Umbilical cord injury	0	0

Table 4 Characteristics of meshes

	TAPP Group	TAPPe Group
Polpropylene mesh-non absorbable tacks	0	0
Polpropylene mesh-absorbable tacks	59 (49,3%)	3/31 (9,7%)
Polpropylene mesh-fibrin glue	66 (42,8%)	22/31 (70,9%)
Self-Locking mesh	29 (18,8%)	6/31 (19,3%)

Table 5 Late complications/variables

	TAPP Group	TAPPe Group
Cronic pain	4/154 (2,6%)	0
Ventral hernia	0	0
Late recurrence	2/154 (1,29%)	0
Late reoperation rate	2/154 (1,29%)	0

Table 6 Early complications/variables

	TAPP Group	TAPPe Group
Total hospital stay (Mediana, gg)	1,5	1,3
Early recurrence rate	4/154 (2,6%)	1/31 (3,2%)
Early reoperation rate	4/154 (2,6%)	1/31 (3,2 %)
Seroma	8/154 (2,6 %)	0

Table 7 Satisfaction score

	TAPP Group	TAPPe Group
GR 0: bad	1 (0,6%)	0
GR 1: medium	5 (3,2%)	1 (3,2%)
GR 2: good	41 (26,6%)	5 (16,1%)
GR 3: excellent	107 (69,5%)	25 (80,6%)

In our opinion the best short and long term perioperative results depend on careful and bloodless dissection of the preperitoneal space, meticulous reduction of the hernia sac, appropriate mesh size, its positioning and fixation; also fundamental is to completely close the peritoneal flap, leaving no gaps [1].

We consider surgery approach more difficult in the elderly in some cases [14] but we also considered laparoscopic approach is, in general, a safe and feasible technique in acute pathology [15] and a safe approach

also in the elderly [16,17]. In our experience, laparoscopic repair of wound defects is a good standard technique also in the elderly.

In conclusion, in our experience, despite the retrospective study limitations, TAPP technique for inguinal hernia repair is an effective and safe technique when performed by experienced hands, also in the elderly. Perioperative intervention related morbidity appears to be within normal limits, and the superiority of laparoscopic technique in terms of post-operative discomfort, improved aesthetic results and early return to work is to be confirmed also in this type of intervention and also in the elderly.

Competing Interests Statement

The authors declare that they have no competing interests.

Authors' contributions

AGF: conception and design, interpretation of data, given final approval of the version to be published.

SE: conception and design, interpretation of data, given final approval of the version to be published.

MS: acquisition of data, drafting the manuscript, given final approval of the version to be published.

AF: acquisition of data, drafting the manuscript, given final approval of the version to be published.

SC: acquisition of data, drafting the manuscript, given the final approval of the version to be published.

EG: acquisition of data, drafting the manuscript, given the final approval of the version to be published.

AS: critical revision, interpretation of data, given final approval of the version to be published

VM: critical revision, interpretation of data, given final approval of the version to be published

Declarations

Funding for this article came from personal funds.

This article has been published as part of *BMC Surgery* Volume 13 Supplement 2, 2013: Proceedings from the 26th National Congress of the Italian Society of Geriatric Surgery. The full contents of the supplement are available online at <http://www.biomedcentral.com/bmc Surg/supplements/13/S2>

Published: 8 October 2013

References

1. Bittner R, Leibl BJ, Jäger C, Kraft B, Ulrich M, Schwarz J: **TAPP - Stuttgart technique and result of a large single center series.** *J Minim Access Surg* 2006, **2**:155-159.
2. Yoon Young Choi, Sun Wook Han, Sang Ho Bae I, Sung Yong Kim I, Kyung Yul Hur I, Gil Ho Kang: **Comparison of the outcomes between laparoscopic totally extraperitoneal repair and prolene hernia system for**

- inguinal hernia; review of one surgeon's experience. *J Korean Surg Soc* 2012, **82**:40-44.
3. Kulacoglu H: Current options in inguinal hernia repair in adult patients. *Hippokratia* 2011, **15**:223-231.
 4. Kukleta JF, Freytag C, Weber M: Efficiency and safety of mesh fixation in laparoscopic inguinal hernia repair using n-butyl cyanoacrylate: long-term biocompatibility in over 1,300 mesh fixations. *Hernia* 2012, **16**:153-62.
 5. Simons MP, Aufenacker T, Bay-Nielsen M, Bouillot JL, Campanelli G, Conze J, de Lange D, Fortelny R, Heikkinen T, Kingsnorth A, Kukleta J, Morales-Conde S, Nordin P, Schumpelick V, Smedberg S, Smietanski M, Weber G, Miserez M: **European Hernia Society guidelines on the treatment of inguinal hernia in adult patients.** *Hernia* 2009, **13**:343-403.
 6. Gonzalo Torres-Villalobos, Laura Sorcic, George Ruth R, Rafael Andrade, Luis Martin-del-Campo A, Kyle Anderson J: **Evaluation of the Rebound Hernia Repair Device for Laparoscopic Hernia Repair.** *JLS* 2010, **14**:95-102.
 7. Bittner R, Arregui ME, Bisgaard T, Dudai M, Ferzli GS, Fitzgibbons RJ, Fortelny RH, Klinge U, Kockerling F, Kuhry E, Kukleta J, Lomanto D, Misra MC, Montgomery A, Morales-Conde S, Reinhold W, Rosenberg J, Sauerland S, Schug-Paß C, Singh K, Timoney M, Weyhe D, Chowbey P: **Guidelines for laparoscopic (TAPP) and endoscopic (TEP) treatment of inguinal Hernia [International Endohernia Society (IEHS)].** *Surg Endosc* 2011, **25**:2773-2843.
 8. Asuri Krishna, Misra MC, Virinder Kumar Bansal, Subodh Kumar, Rajeshwari S, Anjolie Chabra: **Laparoscopic inguinal hernia repair: transabdominal preperitoneal (TAPP) versus totally extraperitoneal (TEP) approach: a prospective randomized controlled trial.** *Surg Endosc* 2012, **26**:639-649.
 9. Amato B, Moja L, Panico S: **Shouldice technique versus other open techniques for inguinal hernia repair (Review).** *Cochrane database of systematic reviews (online)* 2012, **4**:CD001543.
 10. Amato B, Compagna R, et al: **Feasibility of inguinal hernioplasty under local anesthesia in elderly patients.** *BMC Surg* 2012, **12**(Suppl 1):S2.
 11. Ashraf Abbas E, Mohamed Abd Ellatif E, Nashat Noaman, Ahmad Negm, Gamal El-Morsy, Mahmoud Amin, Ahmad Moatamed: **Patient-perspective quality of life after laparoscopic and open hernia repair: a controlled randomized trial and Other Interventional Techniques.** *Surg Endosc* 2012, **26**:2465-70.
 12. **Randomized controlled multicenter international clinical trial of self-gripping Parietex™ ProGrip™ polyester mesh versus lightweight polypropylene mesh in open inguinal hernia repair: interim results at 3 months.** *Hernia* 2012, **16**:287-94.
 13. Fortelny RH, Petter-Puchner AH, May C, Jaksch W, Benesch T, Khakpour Z, Redl H, Glaser KS: **The impact of atraumatic fibrin sealant vs. staple mesh fixation in TAPP hernia repair on chronic pain and quality of life: results of a randomized controlled study.** *Surg Endosc* 2012, **26**:249-254.
 14. Ferrarese A, Martino V, Falcone A, Solej M, Destefano I: **Perforated duodenal diverticulum: case report and short review of the literature.**, *su Chirurgia*.
 15. Solej M, Martino V, Mao P, Enrico S, Rosa R, Fornari M, Destefano I, Ferrarese AG, Gibin E, Bindi F, Falcone A, Ala U, Nano M: **Early versus delayed laparoscopic cholecystectomy for acute cholecystitis.** *Minerva Chirurgica* 2012, **67**(5):381-387.
 16. Ferrarese A, Martino V, Nano M: **Elective and emergency laparoscopic cholecystectomy in the elderly: early or delayed approach.** *BMC Geriatrics* 2011, **11**(Suppl 1):A14.
 17. Ferrarese A, Martino V, Nano M: **Wound defects in the elderly: our experience.** *BMC Geriatrics* 2011, **11**(Suppl 1):A15.

doi:10.1186/1471-2482-13-S2-S24

Cite this article as: Ferrarese et al.: Transabdominal pre-peritoneal mesh in inguinal hernia repair in elderly: end point of our experience. *BMC Surgery* 2013 **13**(Suppl 2):S24.

Submit your next manuscript to BioMed Central and take full advantage of:

- Convenient online submission
- Thorough peer review
- No space constraints or color figure charges
- Immediate publication on acceptance
- Inclusion in PubMed, CAS, Scopus and Google Scholar
- Research which is freely available for redistribution

Submit your manuscript at
www.biomedcentral.com/submit

