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Preliminary results about a novel technique of mesh positioning in the abdominal wall hernia repair

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SUMMARY: **Preliminary results about a novel technique of mesh positioning in the abdominal wall hernia repair.**

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Introduction. *The surgical techniques described to approach the incisional hernia repair are various and there is not consensus about which of them to use. The Intra-Peritoneal Onlay Technique (IPOM) with classic mesh positioning is burdened by high post-operative complication rate. The study shows the preliminary results of a novel technique of open IPOM mesh positioning with "percutaneous" approach.*

Patients and methods. *From January 2010 to December 2016 patients with abdominal wall incisional hernia that underwent surgical operation via open mesh technique for abdominal wall hernia repair at the "Policlinico Paolo Giaccone" at Palermo University Hospital were identified and the data collected were retrospectively reviewed; patients' medical and surgical records were collected from charts and the surgical registries. One hundred thirty-five patients with open IPOM percutaneous mesh positioning were selected.*

Discussion and conclusions. *The observational study proposed showed that the technique described for the abdominal wall incisional hernia repair seems to be hopeful in order to set a post-operative course not burdened by elevated rate of post-operative complications, estimated to be near 37% vs 13% reported by our series.*

KEY WORDS: Abdominal wall hernia - Novel technique - Mesh - IPOM.

Introduction

The overall incidence of the incisional hernia after laparotomy and laparoscopy ranges between 2 and 40%. The surgical techniques proposed to repair the abdominal wall defect range between primary fascial suture repair and mesh mediated repair. The main issues of the recent studies on the abdominal wall incisional hernia repair are about the advantages in performing the surgical operation in laparotomy rather than in laparoscopy, to use or not to use a prosthetic mesh, what kind of prosthesis to use and last but not the least, which technique to prefer in mesh positioning. Anyway it is demonstrated that the use of a prosthesis reduces the recurrence rate from 54% to 12% compared to the conventional suture repair (1-20).

The aim of the study is to describe and to show the results of a different mesh positioning technique in the IPOM mesh mediated abdominal wall hernia repair using dual-mesh prosthesis defined "Percutaneous Technique Positioning" instead of the classic positioning technique.

Patients and methods

From January 2010 to December 2016 patients with abdominal wall incisional hernia that underwent surgical operation via open mesh technique for abdominal wall hernia repair at the "Policlinico Paolo Giaccone" at Palermo University Hospital were identified and the collected data retrospectively reviewed; patients' medical and surgical records were collected from charts and the surgical registries. The diagnosis of abdominal wall incisional hernia was obtained after physical examination and US/CT-scan execution.

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The patients who underwent the surgical operation with IPOM mesh positioning and "percutaneous technique" were identified.

All the operations were performed by one skilled general surgeon, under general anesthesia, receiving pre-operative antibiotic prophylaxis. For all surgical operation, a three-dimensional (3D) textile monofilament polyester (PET) mesh with bioabsorbable collagen film was used (Symbotex, Covidien). The dimension of the mesh used was large enough to cover the fascia 5 cm over the hernia defect borders (overlap) in all directions.

Follow-up period was at least of 1 year. After discharge from the hospital, all patients were examined weekly in the first month then monthly for 6 months and then annually.

The percutaneous technique provides a minimal dissection of the pre-fascial fat and the fixation of the prosthesis by the use of a SuturePasser (EndoClose, Covidien) that crosses the fascia through a micro-incision of the skin in order to permit the anchor of the suture at the anterior fascia surface.

Statistical analysis

Data were analyzed in Excel 2013 and IBM SPSS software, version 21. The median was obtained for continuous variables. Comparison of continuous variables was made using Student's t-test or Mann-Whitney test, where appropriate. Comparison of categorical variables was made with the chi-squared (χ 2) test or Fisher's exact test. The statistical significance level was set to p-value < 0.05.

Results

From January 2010 to December 2016, 135 patients underwent abdominal wall hernia repair with IPOM technique using dual-mesh prosthesis and percutaneous technique.

Pre-operative demographic data are shown in Table 1. The hernia size and the duration of the operation are shown in Table 2.

The post-operative data such as overall complication rate, in-hospital stay, early wound complication, wound infection, haematoma and seroma formation, and recurrence are shown in Table 3.

TABLE 1 - PRE-OPERATIVE DATA.

	Percutaneous technique (n=135)
Sex M	72
Age (mean)	63.5
BMI (kg/m^2) (mean)	28.7
Cardio-vascular disease	15
Respiratory disease	9
DM type 2	8
ASA < 3	82
ASA ≥ 3	53
Smokers	63
Urgency	16

TABLE 2 - INTRA-OPERATIVE DATA.

	Percutaneous technique (n=135)
Operation time (min) (mean)	88.3
Hernia size (cm^2) (mean)	138.5

TABLE 3 - POST-OPERATIVE DATA.

	Percutaneous technique (n=135)
In-hospital stay (days)	5.3
Early wound complications	17 (13%)
Wound infection	5 (4%)
Haematoma	5 (4%)
Seroma	7 (5%)
Late wound complication - recurrence	1 (0.7%)

Discussion

The abdominal wall incisional hernia is among the most frequent complications after abdominal surgical operation with an incidence rate ranging from 2% to 40%. Consequently, abdominal wall incisional hernia repair is one of the main topics in abdominal surgery (21-29).

The abdominal wall incisional hernia is a condition associated with a poor quality of life, high socioeconomic costs and anyway life threatening if complications occur (30-32). There is not consensus about the approach to prefer, which prosthesis to use and which surgical technique to adopt.

Many studies demonstrates the improvement in long-term outcome when a mesh mediated technique is adopted (30-32).

The IPOM technique repair usually avails of the positioning of a polypropylene dual-mesh inside the abdominal cavity fixed at the posterior layer of the abdominal wall through sutures anchored at anterior layer of abdominal fascia. The dissection of the prefascial fat, that is mandatory in the classic positioning technique, is responsible of post-operative complications such as seroma, hematoma formation, wound infection and recurrence. It is demonstrated that as sizable is the dissection as higher is the rate of early complications, the seroma formation above all (31-32).

The percutaneous technique proposed reduces the fat dissection and prevents the post-operative complications comparing them to the classic technique related data.

The observational study proposed showed that the technique described for the abdominal wall incisional hernia repair seems to be hopeful in order to set a post-operative course not burdened by elevated rate of post-operative complications, estimated to be near 37% vs 13% reported by our series. Moreover it seems that surgical operation duration is shorter and the in-hospital stay too (31).

The data about the incidence rate are hopeful too. They show a recurrence rate of 0.7% compared to 23.3% reported by Langbach et al. (33).

Conclusions

The study shows the preliminary results of an innovative and promising technique. Certainly it could be useful to conduct a controlled randomized trial to well define the real potentiality of the technique proposed comparing it to the classic prosthesis fixation.

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