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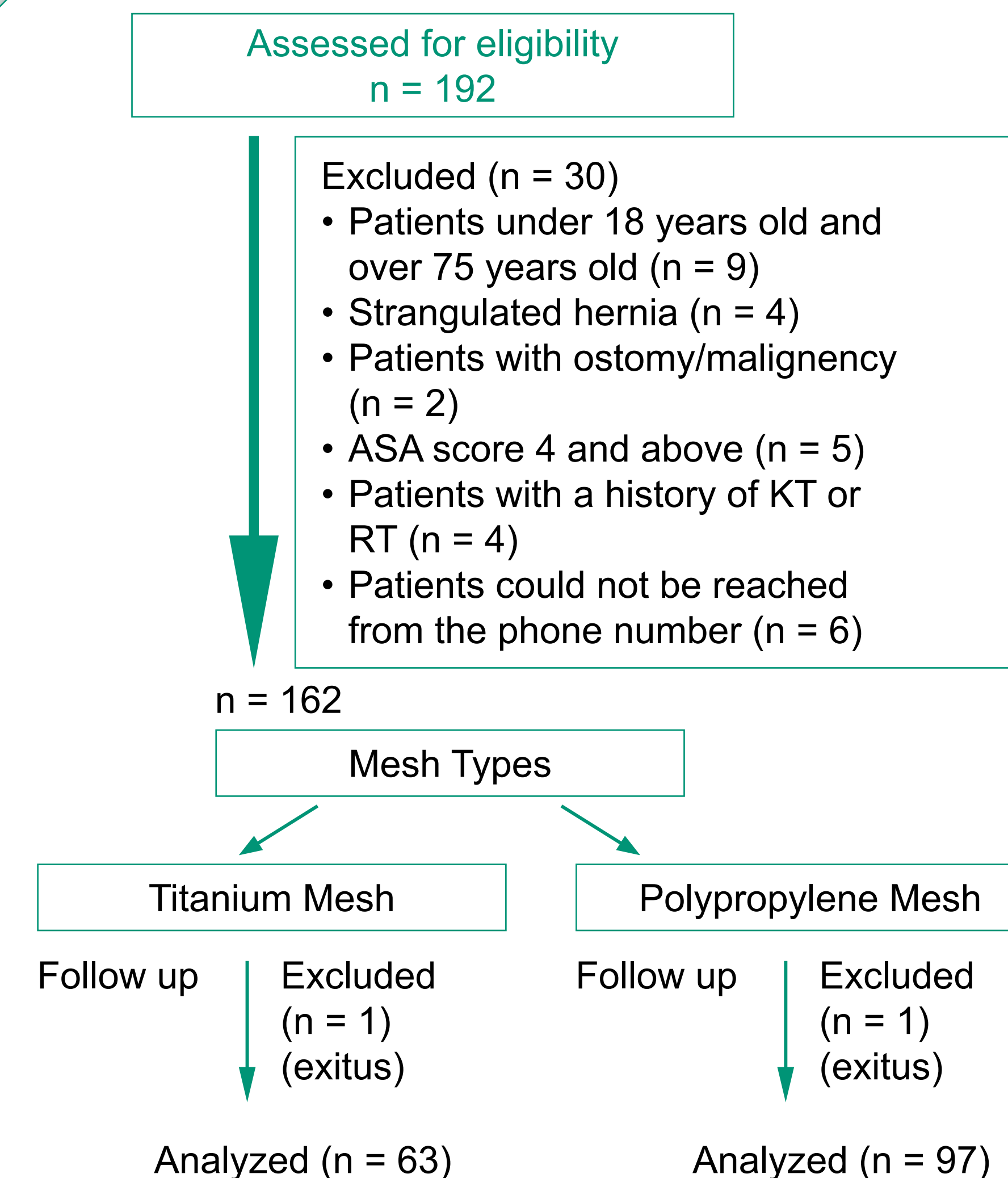
Introduction

Ventral hernia is one of the surgical problems seen commonly at general surgery, 75% of them consist of primary abdominal herniae (epigastric, umbilical, lumbar and spigel) the remaining 25% consist of incisional herniae (1). Likelihood of seeing incisional herniae after primary laparotomy is between 2% to 11% (2). Although there are anterior and posterior approaches at ventral hernia repair, in case of anterior repair, meshes can be placed in many ways (onlay, sublay, inlay and preperitoneal) depending on position with fascia (3). Even if synthetic meshes have some advantages like high tensile strength and low cost, they also have adverse side effects like mesh infection, formation of stubborn seroma, mesh reaction, formation of fistulae (4,5). Polypropylene meshes have been used for hernia repair for a very long time, titanium-coated meshes created by coating polypropylene with titanium dioxide started to be used for hernia repair recently (6). The study intends to present use of titanium coated and polypropylene mesh for ventral hernia onlay repair on recurrence, foreign object feeling and chronic pain.

Methods

Between 1 May 2014-1 January 2018, patients for whom ventral hernia repair onlay titanium and polypropylene mesh were used at the center were reviewed respectively. Gender, age, hernia type, hernia longest diameter, body mass index (BMI), ASA (American Society of Anesthesiologists) score, concomitant comorbid diseases, smoking, hospitalisation duration, operation duration, recurrence, chronic pain and foreign object feeling of patients were analyzed retrospectively. Patients under the age of 18, patients above the age of 75, patients with strangulated hernia, cancer patients, patients with ostomy, patients with history of chemotherapy or radiotherapy were not included in the study. Patient information was recorded from archive files or by calling patients by phone. Titanium dioxide coated polypropylene patch having low weight (47 g/metre (m)²) and wide pore space (2.8 mm (milimetre)) (TiO₂, Biocer, Bayreuth, Germany) and polypropylene patch (Prolene, Ethicon, Holland) were used on patients. Patients on whom titanium-coated mesh were classified as group 1, patients on whom polypropylene mesh were used were classified as group 2. For mesh fixation, 2/0 polypropylene (Prolene, Ethicon, USA) were used as suture on all patients.

Re-emergence of hernia at operation site was discovered with recurrence, physical examination and ultrasound. The patients were asked "do you feel any foreign object at operation site?" for foreign object feeling. Results were recorded as "yes" or "no". Pain status of patients were measured according to visual analog scale (VAS) between 0 (painless) to 10 (the worst pain one can imagine). Pain survey questions included pain during resting, by coughing, while climbing stairs and during physical activity. Chronic pain is considered as pain continuing after month 6 at operation site.



Surgical Technique

Layers were passed through the incision and the peritoneal sac was reached. Adhesions were separated with dissections. The rugged fascia tissues were determined and the peritoneal sac excess was excised. In all cases; facial tissues are confronted and closed with absorbable number 1 polydioxanone suture (PDS, Ethicon Ethnor, SA), subcutaneous tissue is closed with 3/0 vicryl suture (polyglactin 910, Ethicon) and skin is closed with 3/0 polypropylene suture (Prolene, Ethicon, SA) subcutaneously. Titanium and prolene meshes were located on the muscle fascia with defect (onlay) with 2/0 polypropylene sutures (Prolene, Ethicon). The meshes were selected according to the hernia size to safely close the abdominal wall hernia. The size of all meshes was chosen to exceed 4 cm of hernia area. Subcutaneous tissue were confronted with 3/0 vicryl suture (polyglactin 910, Ethicon, Holland) and skin were sutured with 3/0 polypropylene suture (Prolene, Ethicon, Holland) subcutaneously.



Results

The study consisted of 160 patients in total where titanium coated mesh were used on 63 (39.4%) and polypropylene mesh were used on 97 (60.6%) people. 90 (56.3%) of patients were female, 70 (43.8%) were male. Average age of patients was determined as 56.26±10.63 (min 26-max 75). Significant difference was not determined between groups with respect to distribution of gender and age average (p=0.85, p=0.86, respectively). Significant difference was not determined between BMI, comorbid diseases, ASA score and smoking of groups (p>0.05). While of the patients in Group 1, 25 have umbilical hernia, 14 have epigastric hernia and 24 incisional hernia; of the patients in Group 2, 42 have umbilical hernia, 19 have epigastric hernia and 36 incisional hernia. Operation duration is determined as 63.76±17.75 minutes (min) at group 1, and 60.95±12.76 minutes at group 2. Significant difference was not determined between the groups with respect to operation duration (p=0.72). Significant difference was not determined with respect to recurrence between the groups where recurrence had been determined at one patient at either group (p=0.76). Foreign object feeling and chronic pain was determined significantly less at group 1 in comparison to group 2 (p=0.029, p=0.047, respectively). Recurrence, foreign object feeling, and chronic pain information of patients is shown at Table 1.

Recurrences, foreign body feeling and chronic pain information

Variables	Titanium mesh (n=63)	Polypropylene mesh (n=97)	P value
Recurrences	1	1	0.76*
Foreign body feeling	1	11	0.029*
Chronic pain	-	6	0.047*

*: The Mann-Whitney U test applied, and p values of less than 0.05 were regarded as statistically significant.

Conclusions

In case of onlay repair of ventral hernia, while titanium meshes lead to less foreign object feeling and chronic pain in comparison to polypropylene meshes, there is no difference between the two meshes with respect to recurrence.

References

- M.T. Nguyen, R.L. Berger, S.C. Hicks, et al. Comparison of outcomes of synthetic mesh vs suture repair of elective primary ventral herniorrhaphy: a systematic review and meta-analysis. JAMA Surg. 2014;149(5):415-421.
- G.E. Leber, J.L. Garb, A.I. Alexander, W.P. Reed. Long term complications associated with prosthetic repair of incisional hernias. Arch. Surg. 1998;133:378e382.
- Walgenbach M, Mathes T, Siegel R, Eikermann M. Mesh fixation techniques in primary ventral or incisional hernia repair. Cochrane Database of Systematic Reviews, 2015, 3.
- Leber GE, Gard JL, Alexander A, et al. Long-term complications associated with prosthetic repair of incisional hernias. Arch Surg. 1998;133:378-382.
- Bauer JJ, Harris MT, Kree I, et al. Twelve-year experience with expanded polytetrafluoroethylene in the repair of abdominal wall defects. Mt. Sinai J Med. 1999;66:20-25.
- Koch A., Bringman S., Myrelid P., Smeds S., Kald A., Randomized clinical trial of groin hernia repair with titanium-coated lightweight mesh compared with standard polypropylene mesh. Br. J. Surg., 2008;95(10):p.1226-1231.