

Fully extraperitoneal laparoscopic inguinal hernia repair using conventional mesh *versus* tailor-made mosquito mesh: a randomized controlled trial from Cameroon

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Dear Editor

Most surgeons in Africa perform primary closure herniorrhaphy, to avoid the costs of tension-free mesh hernioplasty. Mesh cost is mitigatable by use of sterilized mosquito mesh, cut to an appropriate size¹. In open inguinal hernia repair (IHR) mosquito mesh has an established role. The use of mosquito mesh for laparoscopic IHR is uncommon. Both totally extraperitoneal (TEP) and transperitoneal techniques have advantages. When performing a TEP procedure the use of implanted inexpensive, readily available sterilized tailor-made mosquito mesh makes sense. This study compared the non-inferiority and cost of TEP laparoscopic IHR using sterilized mosquito mesh *versus* conventional mesh (Pariétène macroporous 15×10; Medtronic, Puerto Rico).

All patients undergoing uni- or bilateral IHR for primary or recurrent inguinal hernia with laparoscopic TEP technique (with exploration of contralateral side) between October 2018 and March 2020 were included in this study. For bilateral hernia, the mesh type used was the same on both sides. All procedures were performed by the same team (B.E., A.L., J.L.). After dissection of retroinguinal space, the mesh type was selected randomly. Patients and non-surgical staff were blinded to the mesh type used.

Sixty-two patients (47 unilateral, 15 bilateral; 51 primary and 11 recurrent hernias) underwent TEP treatment with implantation of sterilized mosquito mesh or conventional polypropylene mesh in the study period. Thirty-two patients (8 bilateral, 24 unilateral) randomly received mosquito mesh (group 1), and thirty (5 bilateral, 25 unilateral) received conventional mesh (group 2; Table 1). Mean operative time was 66.9 minutes (unilateral) and 86.6 minutes (bilateral) in group 1, and 64.3 minutes (unilateral) and 73.4 minutes (bilateral) in group 2 ($P=0.460$). All patients in group 1 and all but one patient in group 2 left hospital on the first postoperative day. Medium-term outcomes were identical in

both groups after 15 months' median follow-up (Table 1). No patient complained of chronic pain during follow-up. Physical examination was unremarkable in all participants. Group 1 costs (294 Euros unilateral and 363 Euros bilateral) were less than those of group 2 (373 Euros unilateral and 414 Euros bilateral).

Mesh placement plays a major role in hernia repair in adults, with the established advantages of tension-free repair including low recurrence rates, less pain and a faster return to work. Mesh placement can be performed by an open or laparoscopic approach. The latter has possibly become more popular and is as effective as, if not superior to, an open mesh technique. One drawback of laparoscopy is cost. There have been several reports on mosquito mesh use in hernia repair. Sterilization is an issue, with potential alteration of net surface and pore size, at temperatures above 121°C². Steam sterilization does not affect tensile strength or tear force, and there is no evidence that mosquito mesh are more prone to infection than dedicated meshes. When comparing three plastic mesh types *versus* gas-sterilized polyethylene terephthalate (polyester) mosquito mesh, no difference was noted in biocompatibility. Properly sterilized mosquito mesh is as reliable as conventional mesh³. One meta-analysis showed no difference between commercial meshes and mosquito mesh in adverse events rate⁴.

In this prospective study, the authors found no difference between the groups in short-term complications and medium-term outcomes. The perioperative financial benefit of mosquito mesh is clear, as are the economic value and clinical non-inferiority, with low-cost mosquito mesh 1/1000 the price of commercial meshes⁵. This is the first randomized trial of TEP with conventional *versus* custom-sterilized mosquito mesh. It shows that the latter can be used safely in low-income countries. The present study is limited by the size of the study and the short follow-up period (median 15 months).

Table 1 Demographic details and complications (both early and late) of both groups

	Group 1 (mosquito mesh) (n = 32)	Group 2 (conventional mesh) (n = 30)	P
Sociodemographic characteristics			
Male	25 (78)	23 (77)	
Female	7 (22)	7 (23)	
Age (years)			
15–30	7 (22)	5 (17)	
30–45	6 (19)	3 (10)	
45–55	8 (25)	8 (27)	
55–75	11 (34)	14 (47)	
Occupation			
White collar	16 (50)	10 (67)	
Blue collar	16 (50)	20 (33)	
Complications			
Conversion	2	0	0.001
Seroma	1	2	0.450
Haematoma	2	1	0.450
Peritoneal defect hernia (reoperation and mesh removal)	0	1	0.050
Infection	0	0	–
Recurrence	0	0	–

Values in parentheses are percentages. A P-value lower than 0.050 was considered statistically significant.

However, the TEP technique has a low incidence of long-term complications, and most unwanted events appear early. In this RCT, mosquito mesh use was non-inferior to conventional polypropylene meshes, and is a valuable, cost-effective alternative to conventional meshes in tension-free IHR.

Acknowledgements

The authors gratefully acknowledge the support of the authorities and staff of the hospital, as well as all the patients involved in this study. Ethical authorization reference: 2018/0042/HGOPED/DG/CEI.

Funding

This research was funded by the Belgian government via Académie de Recherche et d'Enseignement Supérieur (ARES), grant ref. ARES-PFS2016Cameroon to J.S.

Disclosure. The authors declare no conflicts of interest.

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