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Prosthetic Mesh Use for Esophageal Hiatal Hernia Repair



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Abbreviations: EHH: Esophageal Hiatal Hernia; PTFE: Polytetrafluoroethylene; HADM: Human Acellular Dermal Matrix Patch; PSIS: Porcine Small Intestinal Submucosal; TCPP: Titanium-Coated Polypropylene

Introduction

Massive hiatal hernia (type II, III and IV), mostly presenting obvious symptoms and leading to severe complications, was necessarily recommended to be treated by surgical procedure timely. The principles of surgical procedures included reduction of the stomach into the abdomen, sac excision, crural closure, and gastropexy or fundoplication [1,2]. Laparoscopic procedure has been commonly applied for the EHH repair [3]. Luketich's largescale (662 patients) postoperative outcome after EHH repair showed that rate of hernia recurrence verified by radiography was 15.7%, and rate of reoperation due to recurrence was 3.17%[4]. Measurements to reduce the recurrence rate after PEH repair should focus on minimizing tension and crural relaxing incisions when necessary. The use of mesh likely is another option that will improve outcomes after EHH repair [5]. High recurrence following laparoscopic repair led to more popularity of mesh use in order to decrease the high postoperative recurrence. A questionnaire on mesh utilization from the members of the Society of Gastrointestinal and Endoscopic Surgeons showed that the most common indication for mesh usage was an increased size of hiatal defect [6].

Utilization of Prosthetic Mesh for Esophageal Hiatal Hernia Repair

I. Commonly Used Mesh Types for EHH Repair Included: Polytetrafluoroethylene (PTFE), human acellular dermal matrix (HADM), porcine small intestinal submucosal (PSIS), and titanium-coated polypropylene (TCPP), but no one mesh type was clearly superior in terms of avoiding failure and complication[7]. It is considerably necessary to use the mesh reinforcement for large defect or fragile closure[8]. The ideal mesh is considered being easy to handle during laparoscopy, able to adhere to the diaphragmatic surface, and benign to the visceral surface on the other side [9]. Use of prosthetic

mesh reinforcement of cruroplasty in large hiatal hernias could effectively prevent hernia recurrences, although the operation time was commonly longer in the mesh group[10]. Furnee's meta-analysis showed that there was no or only a small recurrence in 385 patients in the mesh group and in 182 of 247 (73.7 %) in the non-mesh group [11]. As well Huddy's meta-analysis presented that mesh significantly reduced overall recurrence rates compared to simple suture (14.5 vs. 24.5 %, P = 0.009) [12]. Oelschlager and colleagues reported the outcomes of a multicenter randomized controlled trial that compared the use of biological mesh during laparoscopic EHH repair, with conventional primary cruroplasty. A significant lower recurrence rate at 6 months after surgery was found in the mesh group than the group of patients who underwent cruroplasty alone (9% vs. 23%,P<0.05) [13].

Mesh-Associated Long-Term Complication

Safety of mesh several reports concerning mesh-associated severe complications appeared along with mesh spreading usage, the most common complications included mesh erosion into the esophageal lumen sometimes even requiring distal esophagectomy[14,15], and others as esophageal stenosis or dense fibrosis[14], even mesh erosion into abdominal aorta resulting in massive hemorrhage[16]. Non-degradable characteristics of prosthetic mesh was the possible cause to these adverse effects, novel materials for mesh modification were applied as biologic mesh, it was reported that no mesh induced erosion was observed after use of human acellular dermal matrix patch [17], porcine dermal collagen matrix mesh[18], or porcine small intestinal submucosal patch[13,19], whereas non-absorbable mesh tended to be associated with erosion and stricture[6]. Laparoscopic hiatal hernia repair with acellular human dermis reinforcement results in

improvement of gastric reflux related symptoms and quality of life without mesh-associated complications [20-22].

Conclusion

High recurrence following EHH repair led to more popularity of mesh usage in order to decrease the high postoperative recurrence. Overall, use of prosthetic mesh reinforcement of cruroplasty in large hiatal hernias may prevent hernia recurrence effectively, but the severe mesh associated complications must be recognized and paid attention to clearly. The ideal mesh is considered being easy to handle and of perfect tolerance with human structure. Long-term follow-up and prospective randomized clinical trials are needed to investigate the safety and efficacy of mesh use for EHH repair. Novel materials such as biologic mesh for EHH repair may be promising.

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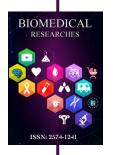
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