Mesh Migration into the Esophageal Wall After Mesh Hiatoplasty

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Introduction

Because of recurrence rates of up to 42% after Nissen fundoplication, the implantation of prosthetic material is recommended in cases of paraesophageal herniation [1, 2]. Clinical studies of patients with gastroesophageal reflux disease have shown that the recurrence of symptoms is mainly caused by intrathoracic herniation of the gastric wrap into the mediastinum [3–5]. Since the first description of hiatal mesh implantation by Kuster and Gilroy [6], many different techniques have been published [7]. Although large series of patients were treated, a good understanding of indications, mesh placement technique, mesh structure, and mesh material is still lacking. Most studies deal with the clinical outcome, such as dysphagia or recurrence rate. Only a few case reports give an account of mesh migration and perforation into the esophagus [8, 9]. One current article by Desai and colleagues deals with histological results 1 year after bioprosthetic repair of paraesophageal hernia with a new small intestinal submucosal (SIS) mesh. The authors found no evidence of erosion of SIS mesh into the esophagus [10]. To examine functional and histological changes in the distal esophagus after implantation of two different alloplastic mesh materials, we performed an animal study in rabbits.

Materials and Methods

Animals and Anesthesia

A total of 20 female chinchilla rabbits (mean body weight 2.5±0.3 kg) were included in this study. The rabbits were randomly assigned to two different groups of equal numbers. The surgical procedure was performed under sterile conditions and general anesthesia by intravenous administration of ketamine 10% (Sanofi-Ceva, Dusseldorf, Germany) and xylazine (Rompun 2%; Bayer, Leverkusen, Germany) [11, 12].

The stomach and the distal esophagus were exposed. Two different meshes–polypropylene (PP; Prolene) and a polypropylene–polyglecaprone 25 composite (PP-PG; UltraPro)–were placed on the hiatus as an anterior onlay patch overlapping the hiatal crura with a circular distance to the esophageal wall of 3 mm. The meshes had a diameter of 2 cm and were fixed to the diaphragm with four polypropylene (6-0) single stitches (Fig. 54.1). The abdominal cavity was closed with two running sutures of 3-0 polyglycolic acid.

Functional Analysis

After 3 months the animals received general anesthesia again. A small gastric tube (6 Ch) was inserted into the proximal esophagus, and watersoluble iodine contrast medium was injected very carefully into the esophagus until deglutition was