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Umbilical hernia repair with mesh: identifying effectors of ideal outcomes

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Mesh

Abstract

BACKGROUND: Quality of life has become an important focus for improvement in hernia repair.

METHODS: The International Hernia Mesh Registry was queried. The Carolinas Comfort Scale quantitated quality of life at 1-month, 6-month, and annual follow-up. Scores of 0 (completely asymptomatic) in all categories without recurrence defined an ideal outcome.

RESULTS: The analysis consisted of 363 umbilical hernia repairs; 18.7% were laparoscopic. Demographics included age of 51.5 ± 13.8 years, 24.5% were female, and the average body mass index was 30.63 ± 5.9 kg/m^2. Mean defect size was 4.3 ± 3.1 cm^2. Mean follow-up was 18.2 months. Absent/minimal preoperative symptoms were predictive of ideal outcome at all time points and increasing age was predictive at 6 months and 1 year. At 6 months, the use of fixation sutures alone versus tacks (odds ratio 14.1) predicted ideal outcome.

CONCLUSIONS: Ideal outcomes are dependent on both patient-specific and operative factors. The durable, ideal outcome in umbilical hernia repair is most likely in an older, asymptomatic patient who undergoes mesh fixation with permanent suture.

Umbilical hernias, along with paraumbilical hernias, are the most common spontaneous adult hernias, accounting for 10% of all primary abdominal wall hernias.[1] Ninety percent of umbilical hernias are acquired; common etiologies for increased intra-abdominal pressure and thus hernias are prostatic hypertrophy, chronic obstructive pulmonary disease, constipation, ascites, morbid obesity, and multiparity.[1–3] In 1901, William J. Mayo[4] revolutionized hernia repair as he described his "vest-over-pants" technique to imbricate the fascial edges at the American Surgical Association. This led to a precipitous reduction in early 20th century recurrence rates, but these are still high by current standards. Modern recurrence rates for Mayo and primary tissue repairs have been reported to be as high as 11% to 54%.[1,2,5] In the 1950s, prosthetic repair with polypropylene was introduced and led to a significant decrease in recurrence rates.[6] Standardization and improvements of hernia repair technique, along with prosthetic reinforcement, have led to historically low recurrence rates in recent years. A prospective, randomized trial comparing suture and mesh repair of umbilical hernias in adults demonstrated a recurrence rate of 1% with mesh repair compared with 11% with suture repair.[7] With the improvement in traditional outcomes, quality of life (QOL) has

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become one of the leading measures of excellence in hernia surgery.[8,9]

Few studies have examined QOL in umbilical hernia repair (UHR) previously; one demonstrated worse QOL in the very early postoperative period (7, 14, and 21 days) with retromuscular mesh placement compared with intraperitoneal mesh placement, but no difference at 1-year follow-up.[10] Worse QOL has also been tied to hernia recurrence after a failed repair.[11] In the measure of QOL, these prior studies employed generic QOL surveys, such as the Short Form 36 (SF-36) and visual analog scales.

QOL examinations for ventral hernia repair are more common in the literature and many have examined mesh type, fixation techniques, sex and hernia size issues, and other demographic and surgical points.[12,13] Fixation methods have been of particular interest in laparoscopic hernia repair, with both tack fixation[14] as well as transfascial sutures[15,16] having been tied to postoperative pain with some variation related to specific time points.[17,18]

The purpose of this study is to identify factors associated with the "ideal" outcome after UHR with mesh: perfect QOL scores and no recurrence.

Methods

International hernia mesh registry

The analysis was performed using the International Hernia Mesh Registry (IHMR)—a multinational, prospective database. More than 30 centers in 10 countries on 3 continents contribute to the registry. Inclusion and exclusion criteria for the registry have been previously described[19] and are contained in Table 1. The registry contains patient data regarding demographics, comorbidities, hernia characteristics, operative details, discharge data, and complications. Additionally, the registry contains patient-reported QOL data at 1 month, 6 months, and annually. The QOL surveys are completed by patients at home or in the office in the absence of a physician or other office personnel with guaranteed anonymity to minimize expectation bias.[19,20]

The IHMR was queried for UHRs from September 2007 to March 2012. To limit analysis to true umbilical hernias, incisional hernias and those with defect length greater than 4 cm in any direction were excluded. Examined outcomes included complications, recurrence, and QOL scores at 1, 6, and 12 months postoperatively.

Carolinas comfort scale and QOL outcomes

Carolinas Comfort Scale (CCS) is a hernia-specific QOL survey that rates the severity of pain, activity limitation, and mesh sensation during 7 different activities, as well as pain and mesh sensation at rest. The CCS has been shown to be superior to the generic SF-36 questionnaire for patients who undergo hernia repair with mesh and it is a validated assessment tool for early and long-term QOL symptoms after hernia repair.[9,21–22] CCS scores are reported on a 6-point Likert scale for each combination of activity with QOL domain, where 0 corresponds to no symptoms and 5 corresponds to disabling symptoms.

Preoperatively and at 1-, 6-, and 12-month follow-up, CCS scores were examined in patients undergoing UHR. To compare each overall QOL domain (pain, activity limitation, and mesh sensation), the maximum score from all activities corresponding to that domain was used for each patient. To define preoperative symptoms, maximum scores

Table 1 Inclusion and exclusion criteria for International Mesh Hernia Registry

Inclusion criteria	Exclusion criteria
Patients who provide a written informed consent	Patients who are less than 18 years of age
Male or female patients greater than or equal to 18 years of age	Patients who have been entered into the registry previously
Patients who are literate and able to understand a language available in the Registry Patient Questionnaires	Employees of the investigator or registry center with direct involvement in the proposed registry or other studies under the direction of that investigator or registry center and employees of Ethicon
Patients scheduled to receive a surgically implanted mesh product for repair of a hernia defect	Patients suffering from and currently receiving medication for chronic pain
Patients who agree to provide long-term outcome data	Patients known to be suffering from pre-existing chronic depression
Patients who agree to provide contact information	Patients currently known or suspected to abuse drugs or alcohol
	Patients suffering from a terminal illness (eg, cancer)
	Patients requiring multiple hernia repairs using more than one mesh or device, except bilateral inguinal or femoral, if operated on the same day. Two or more pieces of the same mesh product sewn together will be considered as one mesh and is therefore allowed in this registry
	Patients scheduled to receive both a synthetic and biologic mesh during the same procedure
	Patients requiring any other (concomitant) surgical procedure
	Patients suffering from an ongoing infection