The American Journal of Surgery (2016) 212, 391-398

The American Journal of Surgery®

Clinical Science

Predictors of inguinodynia, recurrence, and metachronous hernias after inguinal herniorrhaphy in veteran patients

Sergio Huerta, M.D., F.A.C.S.[a,b,*], Prachi M. Patel, B.S.[b], Ali A. Mokdad, M.D.[a,b], Jonathan Chang, M.D.[c]

[a]*Department of Surgery, VA North Texas Health Care System, Dallas, Texas, USA;* [b]*Department of Surgery, University of Texas Southwestern School of Medicine, Dallas, Texas, USA;* [c]*Department of Anesthesia and Pain Management, Dallas, Texas, USA*

KEYWORDS:
Urinary retention;
Chronic inguinal pain;
Mesh;
Bassini;
Femoral hernia;
Lichtenstein

Abstract

BACKGROUND: The present single-institution, single-surgeon experience interrogated morbidity as well as predictors of inguinodynia, recurrence, and metachronous hernias in 953 consecutive inguinal herniorrhaphies between 2005 and 2015.

METHODS: Data were prospectively collected and retrospectively analyzed from patient medical records at the VA North Texas Health Care System.

RESULTS: Ninety-nine percent of our patients were male, 73% Caucasian, 60.4 ± 1.4 years old, body mass index = 26.7 ± 4.2 kg/m^2. Overall morbidity was 11.9%. The most common complication was urinary retention (2.3%). Inguinodynia and recurrence occurred at a rate of 1.5% and .8%, respectively. If a patient had a hernia repair, he had a 12% chance of needing a contralateral repair within 7.6 years. Younger age (odds ratio [OR], .96; 95% confidence interval [CI], .91 to 1.0), current history of smoking (OR, 5.3; 95% CI, 1.3 to 22.3), and a previous contralateral hernia repair (OR, 5.5; 95% CI, 1.2 to 25.0) were independent predictors of inguinodynia. A direct hernia was associated with recurrence (45% vs 100%; P = .02). Current smoking was an independent predictor of recurrence (OR, 5.4; 95% CI 1.0 to 29.3). Age (55- to 75-year old; OR, 2.0; 95% CI, 1.1 to 3.9), age (>75-year old; OR, 2.6; 95% CI, 1.1 to 6.1), an indirect hernia repair (OR, 1.9; 95% CI, 1.2 to 3.1), a pantaloon hernia repair (OR, 2.0; 95% CI, 1.0 to 3.8), and current consumption of alcohol (OR, 1.6; 95% CI, 1.0 to 2.5) were independent predictors of a metachronous hernia.

CONCLUSIONS: The following study presents several factors predictive of outcomes in patients with inguinal hernias that might be useful in preventing complications and providing informed consent to this patient population.

Published by Elsevier Inc.

More than 20 million inguinal hernias are performed every year worldwide.[1] Inguinal herniorrhaphy is one of the most common general surgery operations performed in the United States accounting for 800,000 procedures annually.[2] Inguinal hernia repair is also one of the most common general surgery operations at Veteran Administration (VA) hospitals.[3] In 2005, 48 billion dollars on health care cost in the United States were attributed to this operation.[4] This procedure, therefore, amounts to a substantial health care cost

The authors declare no conflicts of interest.

* Corresponding author. Tel.: +1-214-857-0971; fax: +1-214-857-1891.
E-mail address: Sergio.Huerta@UTSouthwestern.edu

Manuscript received December 24, 2015; revised manuscript January 13, 2016

0002-9610/$ - see front matter Published by Elsevier Inc.
http://dx.doi.org/10.1016/j.amjsurg.2016.01.036

and has important clinical implications such that every aspect that could potentially lower complications and cost should be analyzed.

One in four adult American men are at risk of developing an inguinal hernia.[5] The cumulative incidence of an inguinal hernia in men is 27% and 7% in women,[1] and this risk increases with age.[5] Because the patient population at VA hospitals is largely composed of older men, inguinal hernia operations are likely to continue to increase for the general surgeons practicing at VA institutions across the nation. Veteran patients present with a number of comorbid conditions compared with similarly aged patients in the private sector.[3]

Mortality after elective inguinal herniorrhaphy is unlikely and typically not even reported. However, complications from inguinal hernias ranging from mild urinary retention to severe chronic pain and recurrence might occur in up to 35% (range, 12% to 57%) of VA patients.[6]

Predictors of complications and recurrence have been previously reported for VA patients.[6] However, outcome reporting for inguinal hernia repair is not well standardized[7] and various risk factors for inguinodynia and recurrence have been described depending on the study. In addition, because surgeon's experience has been directly related to complications and recurrence, we elected to interrogate our experience at the Dallas VA Medical Center.

In the present study, we analyzed our hospital records to determine outcomes in a cohort of patients undergoing an inguinal hernia repair for the past 10 years at the Dallas VA Medical Center by the same surgeon. We performed univariate and multivariate analysis to identify predictors of complications, inguinodynia, recurrence, and a metachronous hernia in this cohort of patients.

Methods

A retrospective analysis of a single surgeon's (SH) practice over 10 years (2005 to 2015) inclusive of 953 consecutive inguinal hernias in 874 patients was undertaken at the VA North Texas Health Care System. All cases are consecutive and are presented by number as the hernia was performed. Thus, patient #1 was the first inguinal hernia performed in 2005, whereas patient 874 is the last in 2015. We reviewed hernia repair outcomes in the Computer Patient Record System (CPRS) for all patients with an inguinal hernia repaired by a SH. All hernias were identified via a prospective data base case log kept by the operating surgeon (SH) and retrospectively analyzed. This study was approved by the institutional review board at the VA North Texas Health Care System. All data were reviewed and entered in an excel spreadsheet by P.M.P., A.A.M., and S.H.

Fifty-six variables were extracted from CPRS: operative date, consultation date, date of last examination, date of recurrence, date of metachronous repair, date of inguinodynia, operative time; anesthesia type; hernia type; type of repair; demographics: age, gender, body mass index, ethnicity; social history: history of smoking, current smoking (defined as smoking within 6 weeks of the operation), history of alcohol, current alcohol (defined as drinking within 6 weeks of the operation); comorbid conditions: hypertension, diabetes mellitus, obstructive sleep apnea, dyslipidemia, liver disease (defined by the Child's classification of at least A), cardiac disease (defined as any history of dysrhythmia, CHF, or valvular insufficiency); albumin; length of stay; intensive care unit length of stay; as well as morbidity and mortality. Hernia accident was defined as an acutely incarcerated hernia requiring an emergent operation.

Inguinal hernia repair

Open approach. All hernias were repaired by a standardized method by a SH and a surgical resident (post-graduate year-1 to post-graduate year-5). Most hernia repairs were performed under general anesthesia. Regional anesthetic was also used via spinal regional anesthesia applied by the anesthesiologist. Local anesthetic was also used in 1.8% of the patients. This was always applied by the surgeon (S.H.) as previously described.[8] All patients received preoperative antibiotics per surgical care improvement protocol and institutional guide lines.

Most hernias (99%) were performed via the open technique. Indications for the laparoscopic approach included bilaterality, recurrence, or both. The open approach consisted of a skin incision down to the aponeurosis of the external oblique with electrocautery. A stab incision is made in the aponeurosis of the external oblique and extended toward the superficial inguinal ring with Metzenbaum scissors. The spermatic cord is isolated at the level of the pubic tubercle and encircled with a penrose drain. If the iloinguinal nerve is identified, it is divided and ligated at the most proximal end with 3-0 Vicryl. Indirect hernias undergo isolation of the sac, and the hernia sac is opened and ligated or reduced if a sliding component is suspected. The floor is imbricated with 0-Vicryl if there is a protruding direct component. The floor is then repaired with a 6.0 $\times$ 3.0 inch propyprolyne mesh (ETHICON Inc.) that is cut in a cone configuration to accommodate the size of the inguinal floor by crating tails around the cord structures. This is secured laterally to the shelving edge of the inguinal ligament with 0-polydioxanone in a running fashion and medially to the conjoint tendon with interrupted 0-ethabond sutures. At the end of the operation, 10 mL of .25% bupivacaine with epinephrine (1:200,000) are infiltrated along the hernia incision. Oral opioids are prescribed (hydrocodone bitartrate and acetaminophen; NORCO) for the postoperative period.

Emergent hernias where a bowel resection needed to be performed[3] were repaired via a tissue repair (a modified Bassini repair).

Laparoscopic approach. The laparoscopic approach was performed via the total extraperitoneal technique. A 1-cm