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Commentary: Nationwide analysis of complications related to inguinal hernia surgery in Finland: a 5 year register study of 55,000 operations

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Abstract

BACKGROUND: The aim of this study was to evaluate the incidence of severe complications of adult inguinal hernia surgery from 2003 to 2007 using data from the Finnish National Patient Insurance Association.

METHODS: All major surgical complications are reported to the association because it handles financial compensation for patients' injuries without proof of malpractice. The number of inguinal hernioplasties was obtained from the National Hospital Discharge Registry.

RESULTS: The association received reports of 115 major and 135 moderate complications from 55,000 hernia operations. The overall complication rate was 4.5 per 1,000 hernia procedures. The distribution of injuries consisted of chronic pain (32%), infections (22%), bleeding complications (13%), urologic complications (12%), recurrence (8%), intestinal complications (7%), and miscellaneous disorders (6%). Altogether, 94 patients (38%) received financial compensation from their hospitals. On multivariate analysis, significant associations with chronic pain were found for general anesthesia, length of operation, and the presence of wound complications.

CONCLUSIONS: Chronic inguinal pain and deep infections were associated with severe long-term discomfort and financial compensation to patients with inguinal hernias in Finland.
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Symptomatic inguinal hernias are found in about 15% of adult men, and hernioplasty is among the top 3 surgical procedures in most Western countries. Approximately 11,000 inguinal herniorrhaphies are performed each year in Finland, >80,000 operations in England, and >800,000 in the United States.[1–3] It has been difficult to obtain reliable information on the true complication rates of inguinal hernioplasty in many countries. Recently, national hernia registries have been available from Denmark and Sweden. The reports of these registries have focused mainly on hernia recurrence and the frequency of chronic pain after surgery.[4,5]

In Finland, the Patient Injury Act was enacted on May 1, 1987. To obtain full compensation for patient injury, proof of malpractice is no longer required. The Patient Injury Act ensures compensation for patient injury that (1) probably has arisen because of examination or treatment, (2) has been caused by infection or inflammation, or (3) has been caused by an accident connected with examination or treatment. Every Finnish hospital has an official patient ombudsman who helps patients prepare claims when necessary. Every

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patient is insured by the National Patient Insurance Association, to which all major and most moderate surgical complications and bodily injuries are reported. Bodily injuries refer to illnesses, treatment injuries, equipment-related injuries, infections, or unreasonable injuries during or after surgical procedures. Patient insurance compensates such costs as medical treatment expenses, the loss of income, pain and suffering, permanent functional defects, and permanent cosmetic injuries after surgery. Because of its solid database, the registry of the National Patient Insurance Association offers a reliable source of information for the analysis of complications.

Open mesh repair of inguinal hernias has been the most popular surgical procedure during the past 10 years in Finland. Mesh repair is associated with the lowest recurrence rates of hernia, but chronic pain is the predominant late complication.[6] In the present study, we analyzed all reported complications among adult patients undergoing either open or laparoscopic inguinal and femoral hernia surgery during a 5-year period, with particular emphasis on the factors related to chronic pain after inguinal hernioplasty.

Methods

The retrospective material consisted of 250 complications reported to the National Patient Insurance Association from January 2003 to December 2007. All complications occurring during open or laparoscopic repair of inguinal or femoral hernias in adult patients were included in the analysis. Complications were divided into moderate (n = 135) and major (unreasonable) (n = 115) complications. Indications for surgery in complicated cases were inguinal hernia (n = 196), inguinal pain (n = 23), recurrent inguinal hernia (n = 21), incarcerated hernia (n = 6), or other reasons (n = 4). Moderate complications included superficial infections or hemorrhages, mild or moderate postoperative pain or numbness, and early recurrence (usually because of technical failures). Major complications consisted of marked injuries to the intestine, urinary bladder, testes, or large vessels requiring additional surgical procedures. In addition, severe neuropathic pain resulting in referral to a pain clinic and deep mesh infections were included as major complications. In the analysis, we divided inguinal hernia procedures into 4 additional categories: laparoscopic versus open surgery and mesh versus nonmesh operations. Furthermore, hospital status (university, central, local, or private) and surgeon's training level (resident or specialist) were separately analyzed. Surgery for inguinal hernias in complicated cases was performed at 37 local hospitals, 14 central hospitals, and 5 university hospitals.

The annual number of inguinal hernioplasties was acquired from the Finnish Hospital Discharge Registry, which collects information regarding diagnosis, dates of admission and discharge, and surgical procedures for each patient. The purposes of this registry are research development, administration, and planning. The registry is maintained by the National Board of Health. Every communal and private hospital collects data that are automatically sent to the registry at the end of each year.[7]

The data analysis was carried out using SPSS for Windows version 14.0 (SPSS, Inc, Chicago, IL). Univariate analyses for categorical variables were calculated using χ^2 tests or Fisher's exact tests and for continuous variables with Mann-Whitney *U* tests. A P value $< .05$ was regarded as significant for both tests. The odds ratio served as an approximate estimate of relative risk, because the prevalence of chronic pain was low. Factors associated with residual pain were determined in univariate and multivariate unconditional logistic regression models using a forward selection process. The following independent variables were included: gender, body mass index, type and side of hernia, method of repair, hospital status, surgeon's training level, length of surgery, type of anesthesia, use of mesh, and complications (bleeding, infection) in primary surgery.

Results

From 2003 through 2007, some 55,000 inguinal hernioplasties were carried out at communal and private hospitals in Finland (Table 1). Most procedures (>80%) were performed using an open mesh technique. The number of laparoscopic and femoral hernia repairs remained rather stable. During the 5-year study period, 250 complications were reported to the National Patient Insurance Association.

Table 1 Number of inguinal and femoral hernia procedures in Finland* from 2003 to 2007

Year	Open mesh† hernioplasty	Open sutured	Laparoscopic	Femoral	Total
2003	8384 (80%)	1212 (12%)	627 (6%)	180 (2%)	10,403
2004	8709 (83%)	845 (8%)	773 (7%)	181 (2%)	10,508
2005	9720 (83%)	876 (7%)	980 (8%)	171 (1%)	11,747
2006	9115 (84%)	739 (7%)	859 (8%)	179 (2%)	10,892
2007	9370 (84%)	750 (7%)	820 (7%)	180 (2%)	11,120
Total					54,670

*Population 5.3 million.
†Most patients were operated using the Lichtenstein technique.

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