



Physical strain and urgent need for ergonomic training among gynecologic oncologists who perform minimally invasive surgery[☆]

Jason Franasiak^{a,*}, Emily M. Ko^b, Juli Kidd^a, Angeles Alvarez Secord^c, Maria Bell^d, John F. Boggess^b, Paola A. Gehrig^b

^a Department of Obstetrics and Gynecology, University of North Carolina at Chapel Hill, Chapel Hill, NC, USA

^b Division of Gynecologic Oncology, Department of Obstetrics and Gynecology, University of North Carolina at Chapel Hill, NC, USA

^c Department of Obstetrics and Gynecology, Division of Gynecologic Oncology, Duke University Medical Center, Durham, NC, USA

^d Sanford Women's Health Gynecologic Oncology, University of South Dakota Medical School, Sioux Falls, SD, USA

ARTICLE INFO

Article history:

Received 2 April 2012

Accepted 13 May 2012

Available online 18 May 2012

Keywords:

Minimally invasive surgery

Ergonomics

Occupational strain

ABSTRACT

Objectives. There is limited data regarding physical strain and minimally invasive gynecologic surgery (MIS). We sought to evaluate ergonomic strain among gynecologic oncologists.

Methods. An online survey was sent to all physician members of the Society of Gynecologic Oncology in North America in 2010. The survey contained 42 questions and data was analyzed using univariate and bivariate analyses with summary statistics, *t*-tests, and chi-squared test.

Results. There were 260 respondents (31.2%) to the survey. Case mix was 26% benign and 64% oncologic surgery. Over 52% of respondents had been in practice for greater than 11 years and 52% practice in an academic setting. Physical discomfort related to MIS was reported in 88% (216/244) of surgeons with 52% reporting persistent pain. Increased pain symptoms were associated with surgeon's height, glove size, age and female gender. Patient body mass index (BMI) was associated with pain symptoms in surgeons performing conventional laparoscopic surgery, but not robotic surgery. To decrease pain, surgeons changed positions (78%), limited the number of cases per day (14%), spread cases throughout the week (6%), or limited the total number of cases (3%). Only 29% had received treatment at any time for pain symptoms. Treatment included physical therapy (59%), medical management (28%), surgery (13%), and time off (1%). Only 16% of those with pain symptoms had received formal ergonomic training.

Conclusion. Physical strain rates of 88% are far greater than previously reported. Such prevalent occupational strain presents a growing problem in the face of increasing demand for MIS.

© 2012 Elsevier Inc. All rights reserved.

1. Introduction

Minimally invasive surgery (MIS) has revolutionized patient care across many medical specialties including gynecology, general surgery, oncology, and thoracic surgery. Historically, surgeon strain related to MIS has been quoted at 12–18% [1,2]. A recent study, which surveyed members of the Society of American Gastrointestinal and Endoscopic Surgeons (SAGES) challenged this rate, with 87% of responding surgeons reporting physical symptoms or discomfort [3]. In the SAGES survey, 272 surgeons (86.9%) reported physical symptoms or discomfort. The strongest predictor of symptoms was case volume. Neck, hand, and lower extremity strain was correlated temporally with fellowship training, a time of concentrated case volume. The exceptions

to case volume and strain were eye and back symptoms, which were present even for those with low case volumes. The overall surgeon awareness of ergonomic techniques was low with most being slightly to somewhat aware [3]. Despite these findings, the impact of physical strain on gynecologic surgeons has not been adequately evaluated.

According to the United States Department of Labor statistics, the incidence of work related injury in healthcare and social assistance was 4.8 per 100 full-time workers in 2010, the highest of all industry categories. At present it is difficult to distinguish disability rates of surgeons specifically as most reviews reporting on diseases and disorders are based on all health care workers and do not specify physicians [4]. There are a number of reports in specific subspecialties. Most notably, interventional cardiologists report a 42% rate of spinal injuries, a third of those injuries requiring them to miss work [5]. However, there is no specific literature from the Department of Labor available for gynecologic oncologists.

Despite the potential for surgeon strain, the demand for MIS from patients and providers is increasing. From a patient perspective, MIS techniques hold the promise of shorter recovery period, less postoperative

[☆] Presented at the 2012 Society of Gynecologic Oncologists as a Featured Poster Presentation and at the 2012 Winter SGO meeting as an Oral Presentation.

* Corresponding author at: Department of Obstetrics and Gynecology, University of North Carolina at Chapel Hill, CB# 7570, Chapel Hill, NC 27599-7570, USA.

E-mail address: jfranasia@unch.unc.edu (J. Franasiak).

pain, and potentially fewer operative complications [6,7]. These improvements allow patients and their caregivers to return to their pre-operative level of functioning in a shorter period of time [8]. Prospective data from the Gynecologic Oncology Group (GOG) LAP-2 trial showed that there are benefits from MIS in the immediate post-operative period [7]. Additionally, in the face of the obesity epidemic, there is a perception that MIS techniques may be particularly beneficial in this medically compromised patient population, which will only serve to further increase demand.

Given this trend of increasing MIS volume in gynecologic oncology, with some reports showing a four-fold increase in case volume, and reports in other surgical disciplines of significant physical discomfort, there is a need for information related to strain and work related injuries in gynecologic oncologists [9]. While there is widely held belief that MIS causes greater strain on surgeons than open surgery, there is no data specific to gynecologic surgery, which encompasses a large volume of MIS operative cases in the United States. For this reason we sought to provide information about occupational injury incurred while performing minimally invasive gynecologic surgery in hopes of providing a forum to decrease the incidence of ergonomic strain in the future.

2. Methods

The Institutional Review Board at the University of North Carolina approved the study protocol. An invitation to participate in an online survey was sent by e-mail to 833 physician members of the Society of Gynecologic Oncologists (SGO) in May to June of 2011. Included within the invitation was an explanation of the study and a statement that completion of the survey was voluntary, responses would be used for research purposes, and there was no link between the responses and personal identifiers. The study participants accessed the online survey via a link included in the invitation e-mail. Two reminder e-mails were sent over the course of the study and the survey was closed 2 weeks after the final reminder e-mail was sent.

The survey contained 42 questions which focus on demographics, physical characteristics of surgeons related to ergonomic strain, laparoscopic and robotic surgery volume, ergonomic set-up and characteristics of the operative setting, and operative strain and impact on practices. Answers were yes/no, multiple choice, or numeric response. The questions and answer structure are included in Table 1.

The results from the survey were imported from the online platform into Microsoft Excel and then analyzed using STATA 11® (College Station, TX) software. Univariate and bivariate analyses were performed using summary statistics, student *t*-tests, and chi-square tests, with *p*-value < 0.05 considered statistically significant.

3. Results

3.1. Demographics

Two hundred and sixty (response rate of 31.2%) gynecologic oncology surgeons responded to the survey. Surgeon demographics are summarized in Table 2. The majority (52%) of participants had been in practice for greater than 11 years. Sixty-four percent of surgeons practiced in a university hospital or affiliated setting. Surgeons reported that approximately 65% of surgical cases in any given practice were performed for oncologic indications, and 26% for benign disease. Regarding preferred operative modality, 62% of surgeons preferred to post cases robotically, 25% laparoscopically, and 13% via laparotomy.

Several questions addressed robotic and laparoscopic surgery factors. These responses are summarized in Table 3. Nearly 89% of responding surgeons participated in robotic surgery. Forty-six percent of patients who underwent robotic surgery had a reported BMI of 31–35 kg/m² and 46% had an average BMI of 36–40+ kg/m².

Table 1
Survey questions.

Question	Answer
Demographics	
What year did you finish your residency?	NR
What year did you finish your Gynecologic Oncology Fellowship?	NR
How many years have you been in practice?	MC
Where do you practice?	MC
What environment do you practice in?	MC
What is your height?	NR
What is your age?	MC
What is your gender?	SA
What is your surgical glove size?	NR
How many years has minimally invasive surgery been a part of your practice?	MC
What percentage of each type of cases (benign or oncology) do you do? (Total needs to be 100%)	NR
If you had a preference, how would you choose to post a case?	SA
Robotic surgery	
Do you perform robotic surgeries?	SA
How many robotic cases do you perform a year?	MC
How many robotic cases do you perform in a week?	MC
How many robotic cases do you perform in an average day?	MC
How long is your average robotic case?	MC
What is the average BMI of your robotics cases?	MC
Which type of robot do you have at your institution (if applicable)?	MC
Check all that apply.	
How many robots are available?	MC
Is the robotic system easily accessed?	SA
How is access to the robotic system determined?	SA
Laparoscopic surgery	
How many laparoscopic cases do you perform a year?	MC
How many laparoscopic cases do you perform in a week?	MC
How many laparoscopic cases do you perform in an average day?	MC
How long is your average laparoscopic case?	MC
What is the average BMI of your laparoscopic patients?	MC
Do you have multiple monitors available during laparoscopic surgery?	SA
Who typically assists you?	MC
Describe the fit of the laparoscopic surgical instrument in your hand:	MC
Bipolar, monopolar, needle driver, and grasper.	
Ergonomic strain	
Have you experienced physical discomfort directly related to MIS?	SA
How would you describe this discomfort	MC
Where to you experience symptoms? Check all that apply	MC
How do you attempt to minimize these symptoms?	MC
Are your symptoms limited only to time spent operating or do they persist?	SA
Did you receive specific training in ergonomically sound techniques?	SA
Have you seen a professional (PT, orthopedist, primary care) for your symptoms?	SA
Have you had treatment for physical strain?	SA
What treatment have you had? Check all that apply.	MC
Has this injury caused you to limit your practice?	SA
If yes, how has it limited your practice? Check all that apply.	MC
Have you reported your symptoms to your institutions' employee health resources?	SA

NR = Numeric response, MC = Multiple choice, SA = Single answer.

Meanwhile, 55% of patients who underwent laparoscopy had a reported BMI of 31–35 kg/m² and 12% had an average BMI of 36–40+ kg/m².

3.2. Equipment and operative set-up

A total of 96.4% of responders reported the availability of multiple monitors for MIS. Typical assistants were residents in 41.4%, fellows in 35.5%, surgical technicians in 17.9%, and another attending in 5.2% of cases. Participants were asked to describe the fit of several commonly used laparoscopic instruments. The majority found the instrument fit to be "just right": 70.8% in relation to bipolar devices, 77.8% for graspers, 74.4% for needle drivers, and 84.8% for monopolar devices (Table 4). There was no association between physical strain and type of assistant or perceived fit of the laparoscopic instrument.

متن کامل مقاله

دریافت فوری ←

ISIArticles

مرجع مقالات تخصصی ایران

- ✓ امکان دانلود نسخه تمام متن مقالات انگلیسی
- ✓ امکان دانلود نسخه ترجمه شده مقالات
- ✓ پذیرش سفارش ترجمه تخصصی
- ✓ امکان جستجو در آرشیو جامعی از صدها موضوع و هزاران مقاله
- ✓ امکان دانلود رایگان ۲ صفحه اول هر مقاله
- ✓ امکان پرداخت اینترنتی با کلیه کارت های عضو شتاب
- ✓ دانلود فوری مقاله پس از پرداخت آنلاین
- ✓ پشتیبانی کامل خرید با بهره مندی از سیستم هوشمند رهگیری سفارشات