matched with a ratio that is fixed by design (eg, 1:1, 1:2, 1:3, etc) and compared by estimating their respective odds of past exposure to the suspected risk factor. The main analytic strategy consists of the calculation of the exposure odds ratio and the use of matching and logistic regression to control for potential confounders. Contrary to a cohort study, exposure and outcomes have already occurred at the time the subjects enter the study and inference about causation is made by looking backward in time for antecedent exposure.[3] So the data are not available to calculate the incidence rate of the outcomes being studied.

In their study, Chautard and associates[1] carried out a retrospective analysis of a group of 75 elderly patients (70 years or older) who underwent laparoscopic colorectal surgery for colorectal carcinoma or benign disease. These patients were matched as a group with 103 younger patients who underwent the same procedures. These so-called "cases" and "controls" were compared relative to the occurrence of several end points (conversion to open surgery, mortality, minor and major postoperative complications) using the chi-square test, the Mann-Whitney U test, or the Student's *t*- test. No inference was made about disease causation, and none of the results were reported as odds ratios.

It is clear that this study design does not, by any means, meet the definition of a matched case-control study and would be better classified as a retrospective cohort study or comparison of case series. Misuse of the term *case-control study* is frequent in the surgical literature[4] and can be misleading. For the reader to assess the quality of published evidence, several factors need to be taken into account, including the appropriateness and quality of study design.[5] Misclassification of study design can be confusing when one attempts to critically appraise an article's methodologic rigor and the robustness of the evidence it conveys. With that in mind, we think that the term *case-control study* should be restricted to studies that meet the definition of a classic epidemiologic case-control design.

REFERENCES

1. Chautard J, Alves A, Zalinski S, et al. Laparoscopic colorectal surgery in the elderly patients: a matched case-control study in 178 patients. J Am Coll Surg 2008;206:255–260.
2. Breslow NE, Day NE. Statistical methods in cancer research. Vol. 1. The analysis of case-control studies. Lyon, France: International Agency for Research on Cancer; 1980.
3. Hennekens CH, Buring JE. Epidemiology in medicine. Boston: Little, Brown; 1987.
4. Mihailovic A, Bell CM, Urbach DR. Users' guide to the surgical literature: case-control studies in surgical journals. Can J Surg 2005;48:148–151.
5. Khan KS, ter Riet G, Popay J, et al. Study quality assessment. Available at: www.york.ac.uk/inst/crd/pdf/crd4_ph5.pdf. Accessed Feb 24, 2008.

Pathophysiology of Groin Pain in Sporting Patients May Be More Complex than the Standard Definition of Groin Hernia

Rene Gordon Holzheimer
Munich, Germany

Nam and Brody[1] have demonstrated important issues in the "Management and Therapy for Sports Hernia." It is true to say that a "working knowledge of the pathophysiology of the musculoskeletal, genitourinary, gastrointestinal, gynaecologic, and neurologic systems is essential", but unfortunately they have omitted the investigation of the vascular system, which may cause similar symptoms in the groin.[2]

"Sports hernia" may be a misnomer as it does not embody the true qualities of a hernia, but also it may be true that the current criteria of the diagnosis of hernia may not include recent development and findings in hernia surgery. The diagnosis of a hernia is built on a visible bulge and a palpable hernia sac with/without an enlarged external ring. For surgeons the most important components of a hernia according to the leading German hernia reference book are: hernia ring, hernia sac, hernia sac content, and hernia integument.[3] It is time to re-evaluate the definition of an inguinal hernia open the definition for new and recent findings.

In many patients we have seen a painful bulge in ultrasound but not from outside, which has been supported by intraoperative findings, eg, anterior wall defect and nerve entrapment—intraoperative photograph documentation—and stop of pain after the operation. Often in women there is no visible hernia sac from outside; nevertheless, the intraoperative findings explain the painful situation. Unfortunately many patients suffer from the diagnostic dogma "no visible/touchable hernia sac—no hernia."[4]

Nam and Brody[1] have stated that the internal oblique and the transversus abdominis muscles originate from the lateral inguinal ligament. It has been demonstrated by McVay (1940)[5] and just recently by Acland (2007)[6] that this may not be true. Otherwise they emphasize correctly that many investigators wrongly use the inguinal ligament to reinforce the repair by suturing the inguinal ligament to the aponeurosis of the transversus or internal oblique muscles while the correct layer would incorporate the iliopubic tract not the inguinal ligament.

The authors have correctly pointed out that the decision for the operative technique should reflect the individual situation. The inguinal canal is formed by a complex anatomy in several layers which may not be accessible by a system working in only one plane or which may be limited

to understand and appreciate the functional anatomy of the inguinal canal. "Make the operation fit the patient and not the patient fit the operation."

REFERENCES

1. Nam A, Brody F. Management and therapy for sports hernia. J Am Coll Surg 2008;206:154–164.
2. Rochman AS, Vitarbo E, Levi AD. Femoral nerve palsy secondary to traumatic pseudoaneurysm and iliacus hematoma. J Neurosurg 2005;102:382–385.
3. Schumpelick V. Hernien. 4th edition Thieme Stuttgart 2000.
4. Holzheimer RG, Gresser U. Inguinal hernia vs arthritis of the hip in sporting adolescents. – Case report and review of the literature. Eur J med Res 2007;12:314–319.
5. McVay, Anson BJ. Aponeurotic and fascial continuities in the abdomen, pelvis and thigh. Anat Rec 1940;76:213–231.
6. Acland RD. The inguinal ligament and its lateral attachments: correcting an anatomical error. Clin Anat 2008;21:55–61.

Reply

Fred Brody, MD, FACS, MBA
Washington, DC

We appreciate and agree with Dr Holzheimer's comments about our article. As Dr Holzeimer notes, the concept of a hernia and utilization of the term hernia may need refinement or additional stratifications in the future. This may accurately define a variety of associated disorders in the inguinal region. As technology evolves, radiologic, genomic, and histologic developments may also help classify these additional categories. Finally, our article concurs with Dr Holzeimer's statement that a specific operation must address each patient's specific disorder, regardless of its etiology.

International Medical Graduates and the Global Surgical Workforce: The Perspective from the Other Side

Robert Riviello, MD, MPH
Boston, MA

Doruk Ozgediz, MD, MSc
San Francisco, CA

We would like to thank Dr Leon and colleagues' for their discussion of international medical graduates in the United States. We must, however, also call attention to broader issues concerning the overall global health workforce.

These issues were the focus of the first Global Forum on Human Resources for Health in Kampala, Uganda, March 2–7, 2008. The Forum, hosted by the Global Health Workforce Alliance of the World Health Organization (WHO), adopted the "Kampala Declaration," a 12-point call to develop the world's health workforce, especially in the poorest countries.[2] As surgeons participating in this conference, we wonder what actions the US surgical community will take to confront this crisis.

It is hard to imagine a more pressing issue facing the global surgical community. There is a global shortage of 4.3 million health workers, and 1 million of these are in Africa. Africa bears 25% of the global burden of disease, with only 2% of the world's workforce, and only a small proportion of these are surgeons.[3] Africa may have less than 1% of the number of surgeons in the United States, despite having three times the population; the world's anesthetic and nursing workforces are similarly maldistributed. As a result, most patients in poor countries with routinely treatable surgical conditions never reach a health facility or reach a facility without the human capacity or infrastructure to care for their problem. This leads to morbidity and mortality that are unfathomable to clinicians who have not worked in these settings.

Major donor organizations in poor countries overwhelmingly support programs exclusively related to infectious diseases. Even among nonsurgeons, there is increasing awareness that surgical conditions in low-income countries exact an enormous and, before this, neglected health and economic burden.[4] To reshift this focus, there is an urgent need for surgeons to document unmet global surgical need, to advocate for patients and local clinicians abroad, and to affirm the role of surgery within global public health.

The diverse "push" and "pull" factors from source and recipient countries, respectively, that cause migration must be appreciated.[5] The US already depends heavily on international medical graduates, and because US residency positions are projected to increase, more international graduates will seek training in the US. Creative approaches by rich countries can have an impact, for example, by committing to producing more physicians, directly supporting health worker salaries in poor counties, and by adhering to ethical recruitment practices. Partnerships or "twinning" programs are also a key strategy to improving education and training of health workers worldwide.[6]

Some may believe that this work is reserved for the international humanitarian community, and undoubtedly, volunteerism plays an important role in meeting workforce shortages in low-income countries. But only through a sys-