

Lloyd M. Nyhus

## The posterior (preperitoneal) approach and iliopubic tract repair of inguinal and femoral hernias — an update

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### Nyhus' half century of surgery

#### Early years

Lloyd Milton Nyhus (Fig. 1) was born in Washington, USA in 1923, the son of a Lutheran principal and his devoted wife. His nascent interest in science and medicine were an extension of the caring and nurturing philosophy of his parents.

After graduation from the College of Medicine at the University of Alabama at Birmingham at the height of the Second World War, he had the foresight and good fortune to begin his surgical training in Seattle, WA, USA under the tutelage of Henry N. Harkins, MD, one of the great thinkers of the 20th century. Dr. Harkins was to have a profound and lasting influence on Dr. Nyhus, whose subsequent career mirrored and built on that of his mentor.

Prominent among the topics investigated were burn-wound therapy, disorders of the digestive tract, and hernias.

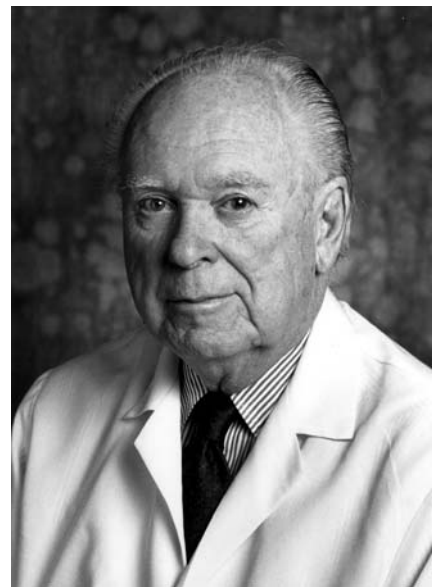


Fig. 1 Lloyd Milton Nyhus

The Seattle ulcer group, led by Drs. Harkins and Nyhus, became well-known at the time for a series of studies on ulcer surgery; during a period of 15 years, their work helped define the operation of vagotomy-antrectomy as the “gold standard” by which all duodenal ulcer treatments would be judged subsequently. It was also during these early years in Seattle that Harkins and Nyhus published their landmark textbook *Surgery of the Stomach and Duodenum*, which included all of the relevant physiologic and clinical factors, which had influenced the development of gastric surgery.

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The Editors of *Hernia* have excerpted short segments of a Festschrift dedicated to Lloyd M. Nyhus, MD, found in the *American Journal of Surgery*, July 1996, Volume 172. The Festschrift was edited by faculty colleagues of Dr. Nyhus at the University of Illinois, College of Medicine, Chicago and included Professors H. Abcarian, P.E. Donahue, and R. Pollak. These excerpts now make up the introduction to this article and are found under the heading “Nyhus’ half century of surgery.”

A video of this hernia approach and repair is available through the American College of Surgeons Collection: Contact, Administration. Cine-Med, Inc., 127 Main Street North, P.O. Box 745, Woodbury, CT 06798, USA, for further information.

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#### Hernia

Groin hernia and the advantages of the preperitoneal approach for their repair also stimulated the interest of Lloyd Nyhus while in Seattle. His work in the field is reflected in the textbook *Hernia*. Together with

Dr. Robert Condon, Dr. Nyhus has continued to present periodic updates of the anatomic dissections and clinical studies that are featured prominently in the textbook. Dr. Nyhus' other contributions to the study of hernia include monographs, book chapters, and articles in surgical treatises and referred journals.

When laparoscopic surgeons turned their attention to groin hernias, they re-discovered earlier work of Nyhus and others that provided the basic information necessary to perform effective operations by minimally invasive techniques.

While not attracted to the laparoscopic approach initially, but true to his customarily fair (and cautious) approach to untested hypotheses, Nyhus has encouraged cautious evaluation of this new approach to hernia repair; although he remains "not convinced" that laparoscopic herniorrhaphy has lasting value on the broad hernia scene, his more recent stance accepts the laparoscopic approach in specific instances, especially recurrent hernias. He is quick to point out, however, that the "open" preperitoneal mesh repair remains the most effective and convincingly demonstrated method to date.

#### The University of Illinois at Chicago

Lloyd Nyhus was recruited to the chair in surgery at the University of Illinois in 1967. In assuming this new position, he faced the enormously difficult task of succeeding an extremely popular and accomplished chairman, Dr. Warren H. Cole.

However, Dr. Nyhus set about the task of reorganizing the Department of Surgery with the same long-term and international view that has characterized all of his major academic works. Recognizing that the modern surgeon would have to develop more specific skills than a generation of previous surgeons, Dr. Nyhus fostered and encouraged the evolution of strong subspecialty groups in general surgery. As a result, the divisions of Surgical Oncology, Gastrointestinal Surgery, Colon and Rectal Surgery, Vascular Surgery, Transplantation, Surgical Endoscopy, Trauma, and Surgical Critical Care were actively supported and became separate surgical epicenters on the near west side of Chicago.

#### Leadership in American surgery

As a leader in American surgery, Lloyd Nyhus has come to be recognized for his insight and vision regarding surgical science, as well as for the human qualities that he brings to any forum where ideas are exchanged. He has long been identified as a leader, beginning with his tenure as president of the Society of University Surgeons and continuing as a participant in the leading surgical societies in the United States.



Fig. 2 Henry Nelson Harkins, professor and chairman, Department of Surgery, University of Washington, Seattle, USA, 1947–1964

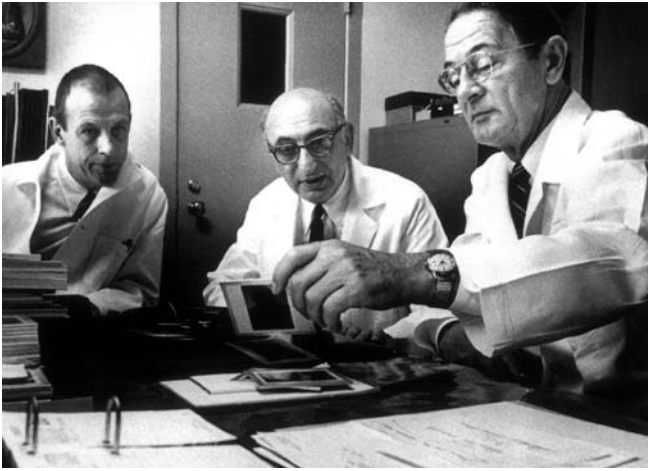
#### Surgical writing

Lloyd Nyhus' name has been synonymous with excellence in medical publishing for more than 25 years; as one of the most prolific and productive medical authors in the United States and the entire world during this period, his works have and will continue to influence every living surgeon.

Indeed, a foray through the author index in medical libraries provides a rich insight to the wide area of his academic interests. Several of his texts (*Hernia, Surgery of the Stomach and Duodenum* [now *Surgery of the Esophagus, Stomach and Small Intestine*, 5<sup>th</sup> edition], and *Mastery of Surgery*, 3<sup>rd</sup> edition) are among the best textbooks in their field, and several have won prestigious publisher's awards for excellence.

#### Summation

When the Surgical Forum of the American College of Surgeons was dedicated to Dr. Nyhus in 1990, it was a very special moment for every member of his extended surgical family. As stated by Dr. Sidney Levitsky in his dedication of the 41<sup>st</sup> volume of the Surgical Forum, "*The committee dedicates this volume to Lloyd Nyhus ... an eminent educator and international surgical statesman ... in recognition of many contributions to nurture young surgical academicians, develop a supportive environment for surgical research, and establish an international bridge of surgical science for serious young investigators throughout the world.*" These carefully chosen words of the committee were indeed appropriate.



**Fig. 3** Clarence J. Berne, professor and chairman, Department of Surgery, University of Southern California, Los Angeles, USA (*right*) with colleagues Leonard Rosoff (*center*) and Arthur Donovan (*left*)

### **The posterior (preperitoneal) approach and iliopubic tract repair of inguinal and femoral hernias — an update**

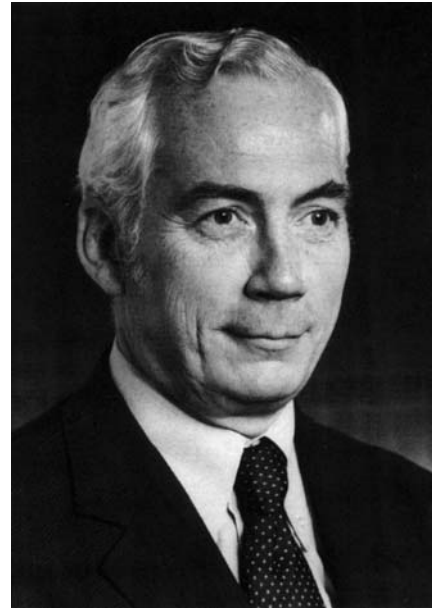
I am pleased to have the opportunity to update the status of this subject. Although we have written regularly upon our experiences, a constant flux of new information asserts itself, necessitating repetitive review. In addition, editorial constraints, at times, have prevented presentation of the complete evolution of our concepts.

#### **The beginning**

As a surgical trainee of Professor Henry N. Harkins at the University of Washington in Seattle, USA, I was indoctrinated into the posterior abdominal wall repair for all groin hernias. Dr. Harkins (Fig. 2), while a staff surgeon at the Henry Ford Hospital in Detroit, MI, USA, became interested in and studied the use of the “Cooper’s” ligament as a key anatomic structure in hernia repair [1]. Indeed, it was Harkins who coined the term “McVay Repair” for this well-known and highly respected procedure. We are reminded that these two surgeon-anatomists (McVay and Harkins) deprecated the use of the inguinal ligament (a portion of the anterior inguinal wall) in the repair of direct, femoral, and large indirect hernias [2].

#### **The move to the preperitoneal approach**

During the 1954 meeting of the Society of University Surgeons in Los Angeles, CA, USA, Dr. Harkins and I visited the Department of Surgery, University of Southern California and its chairman, Professor Clarence Berne (Fig. 3). He and W.P. Mikkelsen were



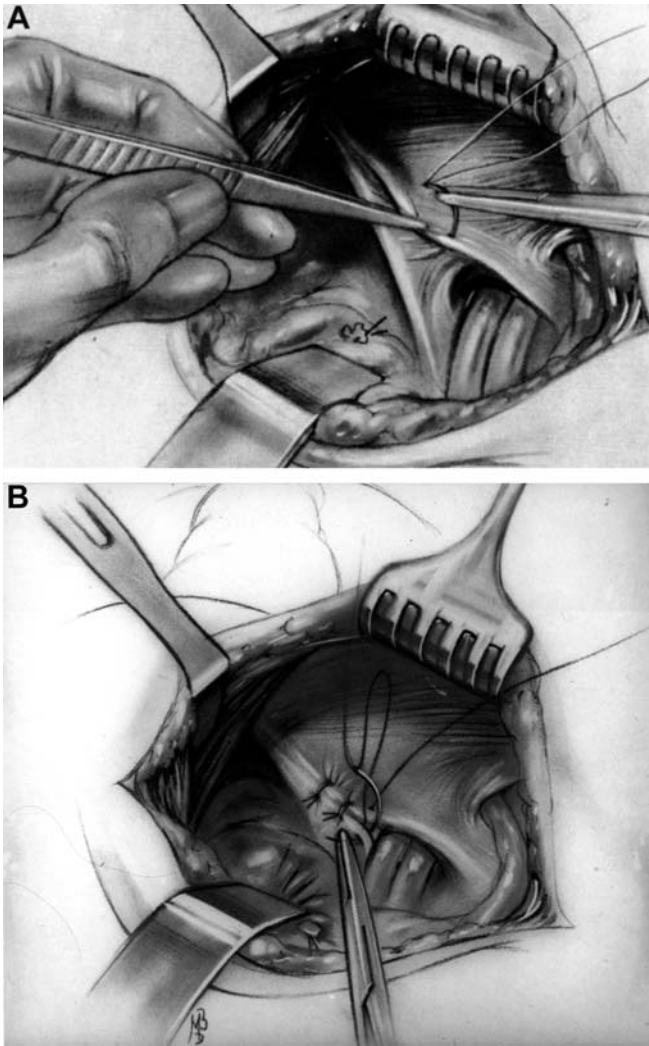
**Fig. 4** Robert E. Condon, professor and chairman, Department of Surgery, Medical College of Wisconsin, Milwaukee, USA 1978–1995

completing a study of the Cheatle-Henry posterior approach via a vertical lower abdominal incision [3].

Upon further search of surgical literature, it became clear to me that the posterior approach had a long and somewhat checkered history [4]. Dr. Harkins agreed that I should study this approach, but I believed a more direct method of reaching the preperitoneal space would be lateral to the rectus muscle. Our first report on this modification appeared in 1959 [5]. Parenthetically, in one patient, we placed a “piece of compressed Ivalon” into a recurrent hernia defect, nicely antedating the current use of prosthetic materials today.

#### **Rediscovery of the ligamentum iliopubicum thomsoni**

The iliopubic tract was described by Alexander Thomson [6, 7], a young Englishman studying in Paris. This very important structure has been well recognized in the anatomic literature of France, most recently by Fruchaud [8], but ignored by our English-speaking colleagues. It was Robert E. Condon (Fig. 4), working in my laboratory at the University of Washington, who redefined the great importance of this structure as it relates to the posterior inguinal wall. He demonstrated by dissection of fresh cadaver material the propinquity of this strong tract to all groin hernia defects, i.e. below indirect and direct and above femoral. Further, Condon in his careful dissection showed the complete separation of iliopubic tract from the inguinal ligament; no, the iliopubic tract is not the “shelving edge” of Poupart’s ligament, but the leading edge of the transversalis fascia layer of the posterior inguinal wall. These are extremely important observations if suture closure of defects from



**Fig. 5** **a** Closure of femoral hernia defect after removal of sac. Sutures placed between iliopubic tract above and Cooper's ligament below. **b** Completion of femoral hernia repair. No prosthetic mesh is necessary

either the anterior or posterior approach is contemplated. It is imperative that these details of gross anatomy be learned and inculcated into our daily operative methodology.

#### A philosophy of approach

The surgical world has a continuing tendency to learn one method or type of operative procedure and use same for all types of groin hernia. From Bassini to Shouldice to Lichtenstein, a devotee of each technique usually is fixed on only that method. Is this fixation necessary? If we understand the anatomic details of a given hernia type, we can modify our operative approaches accordingly. We must review the precise figures of the groin presented by Anson and McVay in 1971 [9], see following figures in this reference: p. 517, IV-53C and 54C; p. 520, IV-57C and 58C; p. 530, IV-67C) to capture the



**Fig. 6** Attendees at Hernia Conference (Chairman Erik Nilsson) Motala, Sweden, 1996. Rene Stoppa, historian and rejuvenator of Pascal's Hydrostatic Principle (*left*); Lloyd Nyhus (*center*); Raymond Read, anatomist and historian of note (*right*)

essence of the formation of the several indirect hernia defects, as well as direct and femoral. This review will clarify how we evolved our classification of hernia types [10]. To this base of information, please add the renewed understanding of the importance of the iliopubic tract and its relationships to the arch of transversalis fascia superiorly and Cooper's ligament below. Our emphasis of anatomical truths and philosophy of repair [4] negates the need for major tissue disruption and/or use of prosthetic mesh for the small Type I, II, and IIIC (femoral) hernias.

As seen in many of the time-honored techniques (Bassini, McVay, Shouldice, etc.), it is clear that we must determine preoperatively by careful history and physical examination that a given patient has a Type I, II, or IIIC hernia. With this vital information in hand, an anterior open approach is taken leaving the posterior wall intact. After removal of the hernia sac, an anterior "plastic" closure of the internal ring [11, 12] may be performed for Types I and II and a posterior iliopubic tract repair will nicely cure a femoral hernia (Fig. 5a, b) [13]. If a preoperative diagnostic error has been made and the patient has a more complicated Type IIIA or B hernia, the operative plan can be easily converted to one of the anterior multiple-layer repairs without harm to the patient; this modification of operative plan should be a rarity.

#### Technical considerations

After a review of our classification of hernia types, it is apparent that we accept a variety of techniques as satisfactory for the larger Type IIIA, IIIB, and IV (recurrent) hernias. Having made this point, we are committed to the posterior iliopubic tract repair with or without a prosthetic mesh buttress. When the mesh is placed, it is held in position with 3–5 non-absorbable sutures. The use of metal staples or tackers posteriorly is contrain-

dictated because of danger to unseen neural structures found anteriorly. In addition, an appropriate-size incision must be used to enter the preperitoneal space. It is imperative that we see the anatomic structures for proper placement of sutures and/or mesh. The tendency to use “key-hole” incisions along with “finger” dissection and “finger” placement of prosthetic mesh is not an acceptable modification of the posterior approach.

### Prosthetic mesh buttress

The history of attempts over decades to find a suitable material to buttress hernia repairs is long and complicated [14]. Today, the word “repair” should be used cautiously as part of the nomenclature, since often the prosthetic materials are used as “patches,” removing the connotation of connecting fascia to fascia with properly placed sutures.

Naturally, we are concerned that an increasing number of patients complain of groin pain (discomfort), particularly in those who have had the prosthesis placed anteriorly in the region of the superficial inguinal and genital nerves [15, 16, 17]. Fortunately, patients in whom mesh is placed posteriorly and fixed by sutures (not by staples or trackers) infrequently suffer this complication; thus, happily, the aforementioned nerves are minimally at risk for this neurodynia.

### Quo vadis

Before this final statement, I wish to recognize the innumerable contributors to this very important subject throughout medical history [18]. Mentors of human anatomy and operative technique are legion (Fig. 6). Fortunately, great contributions will continue to surface, and we all look forward to these advances.

It is almost 50 years (1954–2003) since I began work as a principle investigator of the posterior approach and iliopubic tract repair of primary and recurrent groin hernias. We have reported an overall recurrent hernia rate for primary repairs of 1.7 percent [4]. The same success has been seen and reported by Jose Patino of Bogata [19]. Probably the most meaningful report is that of my former resident, Professor Gerson Greenburg of Brown University, Providence, RI, USA, who has shown in a careful study of first-time recurrent hernia repairs in 248 patients a recurrence rate of only 1.7 percent [20]. These results were confirmed recently [21].

### What of the future?

It is imperative that we continue to stress our information base relative to the complicated anatomical structure of the lower abdominal wall. The tendency to ignore same is not acceptable for surgeons of today and tomorrow. Further, we must ascertain that our trainees have the opportunity to perform a variety of accepted

techniques, assuring our patients the best chance for cure. Fixation upon a single eponymic method (to enhance the reputation of the eponym holder) is inappropriate. The need for improved materials to buttress hernia repairs, regardless of type of procedure, is recognized and, hopefully, the solution will soon be found. The concern relating to the escalation of inguinodynia in the long-term follow-up of our patients [15, 17] must be addressed. Yes, we have improved the overall recurrent hernia rate significantly but at what price? Truly, I am not pessimistic but wish to alert all surgeons interested in this important subject to continue our time-honored vigilance in searching for the truth.

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