

Staff Meeting Bulletin
Hospitals of the » » »
University of Minnesota



Inguinal Node Dissection

STAFF MEETING BULLETIN
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UNIVERSITY OF MINNESOTA MEDICAL SCHOOL
CALENDAR OF EVENTS

January 26 - January 31, 1948

No. 187

Monday, January 26

- 9:00 - 9:50 Roentgenology-Medicine Conference; L. G. Rigler, C. J. Watson and Staff; Todd Amphitheater, U. H.
- 9:00 - 10:50 Obstetrics and Gynecology Conference; J. L. McKelvey and Staff; Interns' Quarters, U. H.
- 9:15 - Fracture Rounds; A. A. Zierold and Staff; Ward A, Minneapolis General Hospital.
- 10:00 - 12:00 Neurology Ward Rounds; A. B. Baker and Staff; Station 50, U. H.
- 11:00 - 11:50 Physical Medicine Conference; Morton Concepts of Painful Feet; G. Keith Stilwell; E-101, U. H.
- 11:00 - 11:50 Roentgenology-Medicine Conference; Staff; Veterans' Hospital.
- 11:00 - 12:00 Cancer Clinic; K. Stenstrom and D. State; Eustis Amphitheater, U. H.
- 12:15 - 1:20 Pediatric Seminar; Porphyrin Metabolism in Relation to Disease; Robert Aldrich; 6th Floor Seminar Room, U. H.
- 12:15 - 1:20 Obstetrics and Gynecology Journal Club; M-435, U. H.
- 12:30 - 1:20 Pathology Seminar; Subtotal Pancreatectomy; Carl Peterson; 104 I. A.
- 12:30 - 1:30 Physiology Seminar; Metabolism of Nucleic Acids as Studied by Radio Phosphorous; Cyrus P. Barnum; 214 M. H.
- 12:30 - 1:50 Surgery Grand Rounds; A. A. Zierold, Clarence Dennis and Staff; Minneapolis General Hospital.
- 1:30 - 2:30 Pediatric-Neurological Rounds; R. Jensen, A. B. Baker and Staff; U. H.
- 4:00 - 5:00 School of Public Health Seminar; Nursing Aspects of Minneapolis Tuberculosis Survey; Jeannette Vroom; Ancel Keys; 113 MeS.

Tuesday, January 27

- 8:30 - 10:20 Surgery Reading Conference; Lyle Hay; Small Conference Room, Bldg. I, Veterans' Hospital.
- 9:00 - 9:50 Roentgenology Pediatrics Conference; L. G. Rigler, I. McQuarrie and Staff; Eustis Amphitheater, U. H.
- 10:30 - 11:50 Surgical Pathological Conference; Lyle Hay and Nathaniel Lufkin; Veterans' Hospital.

- 12:30 - 1:20 Pathology Conference; Autopsies; Pathology Staff; 102 I. A.
- 2:00 - 2:50 Dermatology and Syphilology Conference; H. E. Michelson and Staff; Bldg. III, Veterans' Hospital.
- 3:15 - 4:20 Gynecology Chart Conference; J. L. McKelvey and Staff; Station 54, U. H.
- 3:30 - 4:20 Clinical Pathological Conference; Staff; Veterans' Hospital.
- 4:00 - 5:30 Surgery-Physiology Conference; O. H. Wangensteen and M. L. Visscher; Eustis Amphitheater, U. H.
- 5:00 - 5:50 Roentgenology Diagnosis Conference; Oscar Lipschultz and Staff of General Hospitals; M-515, U. H.

Wednesday, January 28

- 8:00 - 8:50 Surgery Journal Club; O. H. Wangensteen and Staff; M-515, U. H.
- 8:30 - 12:00 Neurology Rehabilitation and Case Conference; A. B. Baker and Joe R. Brown; Veterans' Hospital.
- 11:00 - 11:50 Pathology-Medicine-Surgery Conference; Hodgkins' Disease; E. T. Bell, O. H. Wangensteen, C. J. Watson and Staff; Todd Amphitheater, U. H.
- 4:00 - 5:00 Infectious Disease Routes; Todd Amphitheater, General Hospital, Veterans' Hospital.

Thursday, January 29

- 8:15 - 9:00 Roentgenology-Surgical-Pathology Conference; Walter Walker and H. M. Stauffer; M-515, U. H.
- 8:30 - 10:20 Surgery Grand Rounds; Lyle Hay and Staff; Veterans' Hospital.
- 9:00 - 9:50 Medicine Case Presentation; C. J. Watson and Staff; Todd Amphitheater, U. H.
- 10:00 - 11:50 Medicine Ward Rounds; C. J. Watson and Staff; E-221, U. H.
- 10:30 - 11:50 Surgery-Radiology Conference; Daniel Fink and Lyle Hay; Veterans' Hospital.
- 11:00 - 12:00 Cancer Clinic; K. Stenstrom and D. State; Eustis Amphitheater, U. H.
- 12:00 - 12:50 Physiological Chemistry Seminar; Intermediates in the Biological Oxidation of Isotopic Acetoacetate; Horace Hood; 214 M. H.
- 1:00 - 1:50 Fracture Conference; A. A. Zierold and Staff; Minneapolis General Hospital.
- 1:30 - 3:00 Pediatric Psychiatric Rounds; Reynold Jensen; 6th Floor West Wing, U. H.

- 4:00 - 4:50 Bacteriology Seminar; Dental Bacteriology; William D McBride; 214 M.H.
 4:30 - 5:20 Ophthalmology Ward Rounds; Erling W. Hansen and Staff; E-534, U. H.
 5:00 - 5:50 Roentgenology Seminar; Carcinoma of the Tongue; Donald Peterson;
 M-515, U. H.
 7:00 - 8:00 Urology-Roentgenology Conference; H. M. Stauffer and George Eaves;
 M-515, U. H.

Friday, January 30

- 8:30 - 10:00 Neurology Grand Rounds; A. B. Baker and Staff; Station 50, U. H.
 9:00 - 10:30 Pediatric Grand Rounds; I. McQuarrie and Staff; Eustis Amphitheater,
 U. H.
 9:00 - 9:50 Medicine Grand Rounds; C. J. Watson and Staff; Todd Amphitheater, U.H.
 10:00 - 11:50 Medicine Ward Rounds; C. J. Watson and Staff; E-221, U. H.
 10:30 - 11:20 Medicine Grand Rounds; Staff; Veterans' Hospital.
 10:30 - 11:50 Otolaryngology Case Studies; L. R. Boies and Staff; Out-Patient
 Department, U. H.
 11:00 - 12:00 Surgery-Pediatric Conference; C. Dennis, A. V. Stoesser and Staffs;
 Minneapolis General Hospital.
 11:30 - 12:50 University of Minnesota Hospitals General Staff Meeting; Dermal Hyper-
 sensitivity in Human Brucellosis; A. I. Braude; New Powell Hall
 Amphitheater.
 1:00 - 1:50 Dermatology and Syphilology; Presentation of Selected Cases of the
 Week; H. E. Michelson and Staff; W-312, U. H.
 1:00 - 2:50 Neurosurgery-Roentgenology Conference; W. T. Peyton, Harold O.
 Peterson and Staff; Todd Amphitheater, U. H.
 12:00 - 1:00 Surgery Literature Conference; Clarence Dennis and Staff; Minneapolis
 General Hospital; Small Class Room.

Saturday, January 31

- 7:45 - 8:50 Orthopedics Conference; Wallace H. Cole and Staff; Station 21, U. H.
 8:00 - 9:30 Psychiatry and Neurology Grand Rounds; Staff; University Hospitals.
 9:00 - 9:50 Surgery-Roentgenology Conference; O. H. Wangensteen, L. G. Rigler,
 and Staff; Todd Amphitheater, U. H.
 9:00 - 9:50 Medicine Case Presentation; C. J. Watson and Staff; M-515, U. H.
 10:00 - 11:50 Medicine Ward Rounds; C. J. Watson and Staff; M-515, U. H.
 10:00 - 12:50 Obstetrics and Gynecology Grand Rounds; J. L. McKelvey and Staff;
 Station 44, U. H.
 11:00 - 12:20 Anatomy Seminar; Cocarcinogenesis and Coleukemogenesis; Arthur
 Kirschbaum; Alloxan Diabetes; David Molander; 226 I. A.

N O T I C E

TO DEPARTMENT HEADS:

The Intern's and Resident's Manual is now in the process of revision. Departments will be contacted by Mr. Hemsworth and Mr. Root who are working on this project. It is hoped that all departments will cooperate and give what assistance is necessary to the project.

Ray Amberg

II. INGUINAL NODE DISSECTION

Ivan D. Baronofsky

Inguinal Node Dissections

During the past two years, we have become interested in the technique and indications for inguinal node dissection. Interest in this problem was stimulated by the rather unkind healing of the skin flaps of a patient for whom bilateral groin dissection had been performed after amputation of the penis for carcinoma.

Anatomy of the Inguinal Area

Common usage of the term inguinal has been interpreted as not only that area of the abdominal wall which is nearest the thigh, but also that area of the thigh which includes the femoral triangle. In our discussion the term inguinal will thus be interpreted as such.

A. Blood Supply of Skin of Inguinal Area

The skin over the inguinal area is supplied by the superficial external pudendal artery, the superficial circumflex iliac artery, the superficial epigastric artery. These in turn anastomose with the cutaneous branches of the inferior epigastric artery. The main branches of these arteries run in a fashion which parallels the inguinal ligament and the skin creases of the lower abdomen and upper thigh. As will be described later, during the dissection of the skin flaps, these vessels tributaries can be seen very clearly just within the fatty layer of the superficial fascia of the skin (Camper's Fascia). The direction of the vessels is parallel to the inguinal ligament.

B. The Femoral Triangle

The femoral trigone is a triangular space lying immediately distal to the inguinal ligament. This ligament forms the base of the triangle. The oblique lateral boundary is the medial margin of the sartorius muscle and the medial boundary is the medial border of

the adductor longus muscle. The roof consists of the fascia lata which completely covers the space anteriorly. The floor is made up of two inclined planes, which form a well-marked median groove at their junction. The lateral inclined plane consists of the iliopsoas muscle invested by a thin layer of fascia. The adductor magnus and pectineus muscles, both of which are invested with fascia lata, form the median plane. The most important contents of the prismatic space, included between the fascial roof and floor of the femoral triangle, are the femoral vessels and nerve and their branches. These structures, the termination of the great saphenous vein, the deep subinguinal lymph vessels and glands are embedded in a quantity of loose fatty tissue.

C. Lymph Nodes

The inguinal nodes, as we employ the term, refers to all lymph nodes in the inguino-femoral region. The glands are arranged as a superficial and deep group.

The superficial group are arranged as: (a) a proximal group parallel to the inguinal ligament (superficial inguinal glands); (b) a distal chain on the sides of the long saphenous vein (superficial subinguinal glands).

The chief efferent lymph vessels from the superficial nodes extend either directly into the external iliac lymph-nodes above the inguinal ligament or to the deeper inguinal nodes beneath the fascia. These deep lymph nodes are situated laterally and medially to the femoral vein. The highest and most constant of these deep nodes in the femoral triangle is the so-called Cloquet's or Rosenmüller's node, situated on the medial aspect of the femoral vein at the entrance to the femoral canal, or actually within it.

Both the superficial and deep inguinal nodes drain into the external iliac chain, a group of nodes of the peri-aortic chain. Hugh Young calls attention to a small node located at the ex-

ternal inguinal ring.

Regional Lymphatic Drainage

As a rule the lower trunk area drains toward the groin. The upper trunk area drains toward the axillary vessels. The dividing line is usually extended to between the umbilicus and the small of the back.

The lower extremities drain entirely into the inguinal glands. Rarely, deeper structures around the gluteal region may drain to hypogastric nodes via lymphatics accompanying the gluteal vessels.

There is a very free anastomoses of lymphatic vessels draining the external genitalia, and thus bilateral or crossed metastasis is common. In the main, the lymphatic drainage from the external genitalia reaches the superficial femoral nodes, chiefly of the superficial external pudendal group. From the glans penis and clitoris, deeper lymphatic vessels may pass directly to the deep femoral nodes, or by way of the inguinal canal to the external iliac nodes.

The lymph drainage of the scrotum is remarkably abundant. The collecting lymph vessels originate along the medial raphe and anastomose freely with those of the opposite side. On this account the metastases are nearly always bilateral, and accordingly bilateral groin dissections are indicated.

The lymphatic drainage of the vulva is very extensive also. Malignancies of this area should eventually therefore have bilateral dissections.

The lymph drainage of the peri-anal and perineal regions is to the superficial inguinal glands. The extensive intercommunication of both sides of this area is such that bilateral dissections must also be done.

Indications for Groin Dissections

Groin dissection is indicated in metastatic cancers occurring in the inferior extremity, male and female genitalia, the perineum, the peri-anal zone,

gluteal region and the infra-umbilical segment of the abdominal wall. There is some question as to whether one should wait for definite evidence such as clinically palpable nodes in cases of epidermoid carcinoma of the extremities. Pack and Rekers state that 24 per cent of patients with controlled epidermoid carcinomas of the hands and feet and without palpable regional lymph-nodes, subsequently developed nodal metastases while under observation. They suggest that if dissection of these regional lymph-nodes had been routinely done on admission, 75 per cent of them would have been unnecessary. However, I believe that even 75 per cent of unnecessary operations in the treatment of an otherwise lethal disease is a small risk.

Dean states the experience of the Memorial Hospital in examination of inguinal nodes in epithelioma of the penis. An error of 14 per cent is made in determining whether the presence or absence of metastases in inguinal nodes as diagnosed by physical examination alone. At the time of the first examination, inguinal adenopathy is present in about 76 per cent of the patients. Approximately half of the nodes were cancerous as proven by biopsy later.

Colby and Smith point out the inadequacy of physical examination alone. In a series of 32 cases of groin dissection for carcinoma of the penis, 11 of the total were dissected although no nodes were palpable. In 4 or 36.3 per cent, malignant glands were found on microscopical examination.

Groin dissection may be justified as a palliative procedure, even when involvement is extensive with beginning necrosis provided that the disease can be freed from the great vessels. Any procedure which may prevent the necrotic discharging ulcerations in the groin with the attendant infections and hemorrhages constitutes excellent palliation.

Pack and Rekers enumerate the following postulates for successful groin dissection:

- (1) The primary cancer, wherever located, should be controlled or controllable and should be treated first.
- (2) There should be no clinical evidences of blood stream metastases.
- (3) The lymph stream must be centralward without evidences of blockage and retrograde extension.
- (4) It should be technically possible to excise all of the lymph-nodes involved as suspected of becoming involved.
- (5) There must be some possibility of interruption of the lymphatic spread of the cancer by an excision of these nodes.
- (6) There should be evidence that the cancer has drained only to the regional groups of nodes to be attacked in the groin dissection.

Time of Dissection

Some surgeons have devised en bloc procedures combining groin dissection with operations on the primary focus of disease. (Basset, Taussig, Young). In general, however, dissection of the inguinal group of nodes when indicated is carried out as a later procedure 2-3 weeks after complete control of the primary disease. The groin dissection should not be postponed too long if metastases are clinically evident.

Skin Necrosis Following Dissection

This postoperative complication has been one of the most distressing and frequent cause of morbidity. Taussig in a review of 38 Basset operations states: "In spite of many cases of infected wounds, there were no deaths from sepsis." Lewis in reviewing the results of Young's radical operation for carcinoma of the penis presented 19 cases of infection with slough out of a total of 34 dissections. Pack and Rekers had an incidence of 26 per cent of badly infected wounds out of a total of 122 groin wounds. Taylor and Nathanson in

their monograph on lymph nodes do not give figures as to wound infections but imply that it occurs with distressing frequency.

The causes of necrosis of the skin have been attributed to various factors:

- (1) The presence of a large dead space over the femoral triangle following removal of the lymph nodes, fascia and fat.
- (2) The thin skin flaps.
- (3) Inadequate pressure dressings.
- (4) The presence of bacteria with lymph nodes from the anus and perineal regions which drains into the inguinal area.

Though these may be factors that are important, it is our impression that careful attention to the fundamental principles of surgical wound healing will obviate this distressing complication. Though it is to be admitted that chemotherapy has aided us materially in cutting down the postoperative morbidity of all surgical procedures, it cannot correct any errors of fundamentals and principles. The case that led to an interest in the problem of groin dissection was given all the chemotherapeutic agents at our disposal and with little if any effect.

Technique of Groin Dissection

The patient is placed on the operating table with the corresponding thigh slightly abducted and externally rotated. There is no specificity as to anesthesia; however, if bilateral dissection is to be carried out general anesthesia is used.

The skin incision differs from that suggested by Basset and Taussig. They have suggested a vertical incision. We believe that this type of incision is the cause of the high incidence of wound infection. As was pointed out in the discussion on the blood supply of the skin of the inguinal region, these vessels run in the superficial fascia

in a manner parallel to the inguinal ligament. A vertical incision would cut across the blood supply to the medial flap. Our incision therefore is about a 14 cm. incision parallel to and about 5 cm. below the inguinal ligament. In its course, the middle of the incision is over the palpable femoral artery. Unless the skin is involved no skin is removed with the specimen.

The incision is then carried down to Camper's fascia which can be identified as a definite layer by careful traction upward with a fine rake retractor. The small blood vessels can be seen coursing in the fat immediately above. Skin towels when applied should be clipped with the lightest towel clips possible as heavy manipulation will thrombose the fine vessels to the edges and necrosis will result.

The dissection of the upper flap is then carried out by means of sharp dissection, along Camper's fascia, until a point 2 inches above the inguinal ligament is reached. The dissection then has exposed the anterior superior spine and the external abdominal ring. The scalpel is then turned downward and the fat and fascia over the external oblique aponeurosis cleaned meticulously down to the inguinal ligament. At this point the lower skin flap is dissected down to the apex of the femoral triangle. The long saphenous vein is encountered and divided, when the dissection at this point is carried down and through the fascia lata overlying the muscles in this area. The finest 5-0 silk (Deknatel) is used through except for the larger veins or arteries encountered, for which 4-0 silk is used.

Having outlined both skin flaps, the fascia lata is then incised at the lateral border of the sartorius and the medial border of the adductor longus. The dissection is then carried out carefully in a centripetal manner from below upward and from either side inward so that at the end of the procedure the specimen will be attached only by means of the saphenous vein entering the femoral vein.

In dissecting out the femoral vessels, the adventitial layer of the artery and vein is stripped together with the fat and fascia intervening between these vessels. Near the lower angle of the femoral triangle several small lymphatics may be encountered which should be ligated.

The dissection then persists from above downward resuming at the inguinal ligament toward the saphenous vein. The femoral vessels are again stripped carefully of adventitia, fat and fascia. Along the medial side of the femoral vein, the femoral canal is carefully cleaned. The inguinal ligament is retracted upward and the vessels cleaned as far as is possible. The spermatic cord should be palpated during the dissection and fascia overlying it dissected with the specimen.

During the dissection care must be taken to preserve the various cutaneous nerves to the thigh if they are not involved, as an annoying anesthesia will result.

Having completely and carefully bared the femoral triangle, the saphenous vein is then ligated and cut and the block specimen removed. A prismatic defect is thus left around the femoral vessels. This is filled by means of the following procedure: The sartorius muscle is cut at its origin at the anterior superior spine. It is then swung over the defect present around the femoral vessels. Fine 4-0 silk sutures are then placed between the upper cut end of the muscle and the inguinal ligament above the femoral vessels. Especial care must be observed in suturing the muscle above the femoral canal to prevent a hernia from occurring.

The lateral side of the muscle is then sutured to the iliacus with a series of interrupted sutures. This is repeated on the medial side approximating the sartorius to the adductor longus.

Hemostasis being complete, the final

stage of the dissection is begun. Fine 5-0 silk sutures approximate the under-surface of the skin flaps to the sartorius muscle. These are staggered and are put in so that there is a minimal dead space between the flaps and the underlying muscle. This will also relieve any tension on the skin approximation if some has been removed because of involvement.

Camper's fascia is then approximated with interrupted fine silk. This maneuver will also prevent any tension on the skin edges. The skin is then approximated

with fine epithelial catches which can be left in place for 10-14 days.

A light dressing is applied and no drains are used. The patient is kept in bed for 24-48 hours and then ambulated.

Results

The procedure described above has been performed on eight patients within the past two years. In one the incision was vertical instead of parallel to the inguinal ligament.

Table I

Inguinal Node Dissections

Patient	Sex and Age	Primary Disease	Bilateral or Unilateral	Skin Slough	Remarks
	M - 37	Ca. of Sigmoid	Unilateral	-	Axillary dissection with + nodes
	F - 69	Melanoma - foot	Unilateral	-	Amputation previous
	M - 61	Ca. of Rectum	Unilateral	-	Abdomino-perineal resection
I	F - 62	Squam. Cell Rectum	Bilateral	-	Seroma aspirated 7- cc. rt. 2 + edema legs
	M - 27	Melanoma - foot	Unilateral	-	Seroma. Vertical incision - 150 cc. aspirated
	M - 66	Ca. Rectum	Unilateral	-	Combined abdomino-perineal resection
	M - 59	Ca. Rectum	Bilateral	-	Wound - separation on left. Fluid underneath skin margin. No slough. Healed well.
	M - 20	Melanoma - heel	Unilateral	-	Amputation

Summary and Conclusions

A review of the anatomy of the inguino-femoral region is presented. The indications for the procedure of inguinal node dissection is presented. A method of inguinal node dissection is presented in which anatomical consideration to the blood supply of the skin flaps and obliteration of dead space is made. The results suggest that this method is adequate in preventing the common post-operative complication of necrosis and slough of skin.

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