



Surgical Management of Metastatic groin lymphadenopathy- Retrospective study of 50 Cases in Regional Cancer Center

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Abstract

Introduction: *Surgery of malignant disease is not the surgery of organs, it is the anatomy of the lymphatic system. Lymph node metastasis are 'Indicators, not Governors' of outcome in every major study of epithelial cancer. Groin dissection has key role in the management of metastatic lymph node disease from primary cancer in the anatomical areas drained by these nodes i.e. Peno-scrotal, vulvo-vaginal, ano-rectal and skin cancers of the infra-umbilical trunk, perineum, buttocks and lower extremities. Tumors associated with these structures are squamous cell carcinoma, malignant melanoma, less frequently adenocarcinoma and sometimes soft tissue sarcoma. Pre operative diagnosis and post operative care of these patients involves the role of general surgeons, urologist, gynecologists and oncologists.*

Aims and Objectives

1. Incidence and severity of post operative morbidity.
2. Patient related risk factors affecting these morbidity.
3. Procedure related risk factors affecting these morbidity.

Methods and Materials: *This is a retrospective study with sample size of 50 patients, who underwent 70 surgeries for Groin dissection conducted at Kidwai Cancer Institute which is one of the Regional cancer centre from 2013 to 2014.*

Results

- *Oblique incisions are associated with decrease infection of wound complications.*
- *Synchronous surgery of the primary and groin is the risk factor for wound infection.*
- *Patients with pathologically positive groin lymph nodes have increased risk of skin flap problems.*
- *Radical groin lymph node dissection patients had increase rate of lymphedema.*

Pathology

Pathology of tumours commonly metastasising to the Inguinal lymph nodes.

Tumours of the male genital tract

Squamous cell carcinoma is the most common tumour of the penis, accounting for 95% of primary penile malignancies.

Relatively uncommon in developed countries, it accounts for upto 17% of all male malignancies in developing countries. The mean age of affected individuals is 64 yrs⁽¹⁾. Palpable inguinal lymphadenopathy at presentation may represent metastatic disease or secondary inflammation, so a 4-6week course of oral antibiotics is usually prescribed, followed by re-evaluation of the lymphadenopathy. However, studies have shown that up to 20% of patients with no palpable lymphadenopathy will have nodal metastasis⁽²⁾.

Tumours of the female genital tract

Tumours arising from the vulva and lower third of the vagina metastasise to the inguinal lymph nodes. Vaginal tumours are rare. Squamous cell carcinoma is the most common tumour of the vulva (Table-1), Incidence increases with increasing age. The presence of lymph node metastasis is related to the size and depth of invasion of the primary tumour⁽³⁾.

Tumours of lower gastrointestinal tract

Squamous cell carcinoma of the anal canal is the most common gastrointestinal tumour to metastasise to the inguinal lymph nodes. It is a relatively uncommon tumour, Women are affected more often than men⁽¹⁾. Inguinal node metastasis is a poor prognostic indicator and such patients should be recruited into clinical trials for treatment modalities wherever possible in order to determine optimal treatment.

Cutaneous tumours

Malignant tumours of the skin, most commonly malignant melanoma or squamous cell carcinoma arising on the legs and trunk may metastasise to the inguinal lymph nodes. Women are affected more commonly than men. The incidence increases markedly over age 30yrs and peaks

in the sixth decade. Tumour thickness is correlated with the probability of lymph node involvement⁽⁴⁾. Squamous cell carcinoma is more common than malignant melanoma and has a similar epidemiology and aetiology. The leg is an uncommon location for squamous cell carcinoma which may occur when associated with immunosuppression or chronic ulceration (Marjolin's ulcer). Tumour thickness is again correlated with the probability of lymph node involvement.

Table-1 Pathology of tumours commonly metastasising to the inguinal lymph nodes.

Organ system	Tumour
Male genital System	Squamous cell carcinoma of penis
Female genital System	Squamous cell carcinoma of vulva
Lower gastrointestinal tract	Squamous cell carcinoma of anus
Skin cancers	Malignant Melanoma, Squamous cell carcinoma

Anatomy of the groin (Fig-1)

The lymphatic system is a physiological continuum, yet the inguinal lymph nodes are traditionally divided into two anatomical groups. The superficial inguinal nodes are found superficial to the fascia lata within the boundaries of the femoral triangle. They receive afferent superficial lymphatics from the lower extremity, scrotum, penis, vulva, clitoris, anus, and infra-umbilical region of the anterior abdominal wall. The femoral triangle is bounded superiorly by the inguinal ligament, medially by adductor longus, and laterally by sartorius. The roof of the femoral triangle is formed by fascia lata, and the floor is comprised of the iliopsoas and pectineus muscles and contains the femoral neurovascular structures as they pass beneath the inguinal ligament.

Deep to the fascia lata, medial to the femoral vein, reside six to eight deep inguinal nodes, including Cloquet's node, which is sited at the

apex of the femoral canal. The deep nodes receive afferents from the superficial inguinal nodes and the deep lymphatic trunks associated with the femoral vessels, which in turn drain the popliteal nodes. The deep inguinal nodes drain into the external iliac nodes, which also receive direct afferents from the superficial inguinal group.

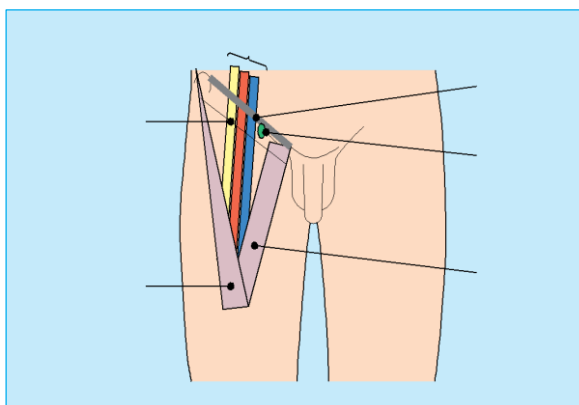


Fig 1 Representation of Right groin, showing the land marks of femoral triangle

Clinical Assessment

After a comprehensive medical history has been obtained, the patient should be thoroughly examined clinically, including the site of the primary tumour. For examination of the inguinal nodes, the patient should be positioned supine and appropriately exposing from umbilicus to the mid thigh. Both femoral triangles should be systematically palpated firmly but gently, to detect any underlying lymphadenopathy. The affected lymph nodes often have a firm, bean-like consistency. Patients at risk of developing inguinal metastases can be taught to use this technique to examine themselves. General examination to exclude generalised lymphadenopathy or metastatic disease should be undertaken. It is relatively uncommon to have an unknown primary lesion manifest as a palpable metastatic inguinal node⁽⁵⁾. Detection of palpable lymphadenopathy in a patient with possible

malignancy should trigger an urgent referral to an appropriate specialist.

Investigations

All the patients investigated by ultra sonogram of both groins, pelvis and abdomen. Endoscopic procedures i.e. Urethrocytoscopy, colonoscopy and procto-sigmoidoscopy. Fine needle aspiration cytology and core needle biopsy. Open lymph node biopsy is avoided in our study to avoid compromising the subsequent surgery. Chest x-ray, computed tomography or magnetic resonance imaging are under taken to stage the disease accurately.

Sentinel lymph node biopsy (Fig-2)

As a potential solution to the high morbidity associated with prophylactic inguinal lymphadenectomy, sentinel lymph node biopsy can be performed in order to identify those patients with micrometastatic nodal disease, therefore avoiding major surgery in patients without metastatic disease.

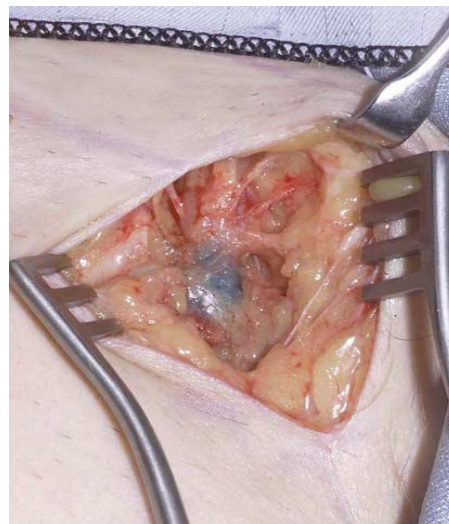


Fig.2 Intraoperative appearance of a left groin sentinel lymph node stained with blue dye.

Theoretically, lymphatics from defined areas of the body follow a predetermined pattern of drainage and consistently drain to a “sentinel” lymph node in a nodal basin. The sentinel node will therefore be the first to contain metastatic tumour cells. If tumour

cells are absent from the sentinel node, the remainder of the nodal basin is assumed to be tumour free. On the day of surgery, technetium-99m radio labeled nanocolloid (which has a half life of six hours) is injected at the site of the primary tumour or excision biopsy scar and a lymphoscintigram is obtained that details the site and number of sentinel lymph nodes. At operation, blue dye is injected around the primary tumour or excision biopsy scar. The incision is made over the radioactive “hot spot” detected by the handheld gamma camera. The location of the sentinel node in the groin is determined by using the camera and by visualisation of blue dye in the node (Fig-2). When this combined approach is used, 98% of sentinel nodes are successfully identified in our department which corresponds favourably with the published literature⁽⁶⁻¹¹⁾. Sentinel lymph node biopsy has been studied most extensively in the context of malignant melanoma⁽¹²⁾.

The American Joint Committee on Cancer staging system for melanoma includes micrometastasis in the regional lymph nodes—sentinel lymph node biopsy positive⁽¹³⁾. A recent report proposes a survival advantage for patients having lymphadenectomy for micrometastatic disease⁽¹⁴⁾. However, the results of prospective randomised controlled trials dealing with this important issue are currently under way and are due to report in the near future. Sentinel lymph node biopsy is now also being used to provide accurate staging information in other solid tumours, including squamous cell carcinoma of the vulva, penis and anus⁽¹⁵⁾. Experience of sentinel lymph node biopsy in these cancers is at an early stage and large, multicentre, randomised controlled trials are required to define the role of the procedure in these and other solid tumours⁽¹⁶⁾. However, sentinel lymph node

biopsy may render prophylactic lymphadenectomy obsolete.

Prophylactic versus therapeutic inguinal lymphadenectomy

For penile and vulval squamous cell carcinoma, prophylactic inguinal lymphadenectomy has been recommended. A prophylactic inguinal lymphadenectomy aims to remove clinically undetectable micrometastases in order to prevent further dissemination of disease. The benefits of this approach must be weighed against the morbidity of the procedure. Therapeutic inguinal lymphadenectomy is undertaken when lymph node involvement is confirmed pathologically. Surgical management of vulval squamous cell carcinoma comprises resection of the primary tumour and bilateral inguinal lymphadenectomy. In patients who are unfit to have radical surgery, radiotherapy may be administered to the inguinal lymph nodes, results in less morbidity but a higher incidence of groin recurrence and poorer survival than surgery⁽¹³⁾. In penile squamous cell carcinoma, timing of the inguinal lymphadenectomy is controversial.

Proponents of prophylactic lymphadenectomy note that patients without clinical lymphadenopathy have a 20% rate of occult lymph node metastasis. In contrast, proponents of therapeutic lymphadenectomy have proposed that close observation with bimonthly clinical examination for three years allows detection of disease and subsequent lymphadenectomy at a curable stage. In patients with a unilateral recurrence, bilateral inguinal lymphadenectomy should be undertaken, as the incidence of occult contralateral metastases is high owing to cross over lymphatics at the base of the penis. Prophylactic lymphadenectomy in melanoma has not been shown to improve survival, although the procedure may be beneficial in certain population

subgroups^(14,15). The UK guidelines for the management of cutaneous melanoma do not currently support routine prophylactic lymphadenectomy⁽¹⁶⁾. In anal squamous cell carcinoma, inguinal lymphadenectomy is generally reserved for those patients with clinically evident disease in the inguinal nodes after the course of chemoradiotherapy has been completed.

Surgical approach

Historical Prospective

In 1948, Daseler et al, described precise anatomical outline of the groin lymph nodes.

In 1948 Baronofsay, described technique of Sartorius muscle transposition.

In 1912, Basset, First discribed the aim of the surgical procedure is to remove en bloc the deep and superficial lymph nodes of the inguinal region⁽¹⁷⁾. Additionally, an ilioinguinal, or radical, groin dissection may be performed, where the inguinal, iliac, and obturator nodes are removed in continuity⁽¹⁸⁾.

In 1977, Cabana et al, studied concept of centinal lymph node biopsy. Catalona described technique of modified groin dissection.



Fig-A: Incision marking



Fig-B: Lymphadenectomy.



Fig-C: Sartorius muscle isolation



Fig-D: Sartorius muscle transpositioned



Fig-E: Wound closure with drain.

The skin incision is made parallel to the inguinal ligament, and thick skin flaps are raised so as to cause minimal disruption to the subcutaneous vascular plexus and hence reduce the risk of skin flap necrosis and consequent postoperative wound breakdown^(19,20).

This straight oblique incision is superior to the straight vertical and S-shaped (“hockey stick”) incisions, which are associated with an increased rate of postoperative complications⁽²¹⁾.

Superficial inguinal lymph nodes in the previously described distribution are removed en bloc. Traditionally, the long saphenous vein is sacrificed, although recent evidence shows that its preservation may reduce the risk of postoperative lymphoedema without compromising the risk of local recurrence⁽²²⁾. Exposure of areolar tissue in the proximity of the femoral vessels deep to fascia lata allows access to the deep inguinal nodes.

Before wound closure, a sartorius transposition is usually performed—the muscle is divided at its proximal insertion, and the muscle belly is reflected medially and secured to the inguinal ligament, hence protecting the underlying femoral vessels in the event of a postoperative wound breakdown⁽²³⁾.

After meticulous haemostasis has been obtained and a suction drain placed, the skin is closed in a tension free manner.

A preoperative opinion from a plastic surgeon is warranted if problems with primary wound closure are anticipated. Examples of specific indications for plastic surgery referral include previous groin surgery, lymph nodes fixed to skin, or postoperative skin flap necrosis. Soft tissue coverage may be achieved by means of a musculocutaneous flap.

Postoperative course

No robust evidence exists for the optimal period for maintaining post-operative suction drainage. Some authorities advocate early drain removal at 24 hours after surgery, whereas others recommend removal once drainage falls beneath a specific threshold (30-50 ml over 24 hours)—which may take some weeks. Although many surgeons advocate early discharge, often with suction drains in situ. Early ambulation is encouraged to minimise the risk of deep vein thrombosis, although mobilisation accelerates lymph flow from the lower extremity and may augment lymph drainage. Patients are unlikely to be fit to drive for at least four to six weeks after surgery.

Postoperative complications

Although rarely fatal, postoperative complications after inguinal surgery are extremely debilitating and harbour considerable socioeconomic costs (Table-2)⁽²⁴⁾. Wound infection (Fig-3) or dehiscence is

more likely in elderly or obese patients⁽²⁵⁾. In addition, smoking, poor nutrition, and treatment with immunosuppressant drugs represent independent risk factors for impaired wound healing. Other common complications include seroma formation (a collection of serous tissue fluid), development of lymphocele (a collection of lymphatic fluid) and lymphoedema of the lower limb. Wound cellulitis requiring readmission for treatment with intravenous antibiotics is not uncommon, and occasionally an abscess requires drainage under general anaesthesia. The rate of lymphocele formation is reduced by meticulous suture or clip ligation of divided lymphatics and use of suction drainage. Lymphoceles or seromata may be treated in the outpatient clinic by regular percutaneous aspiration, or the instillation of sclerosants such as povidone iodine, talcum powder, or doxycycline.

Results

Age: Median age is 58 years (31 to 80)

Sex: Male: Female 22:28

Laterality

Unilateral Groin dissection: 29

Bilateral Groin dissection: 41

Table 2: Age wise distribution of Subsite

Age	Penis	Vulva	Skin	Total
31-40	01	01	02	04
41-50	02	02	04	08
51-60	04	04	06	14
61-70	05	05	08	18
71-80	00	04	02	06
	12	16	22	50

Primary site cancers

Penis : 12

Vulva : 16

Skin : 22

Pathological tumor subsite

Squamous cell carcinoma : 32

Malignant melanoma : 18

Extent of surgery

Superficial inguinal node dissection: 42

Radical inguinal node dissection: 08

Table 3: Post Operative wound Complications

	Mild		Moderate		Severe		Overall	
	No.	%	No.	%	No.	%	No.	%
Wound infection	50	71%	09	12%	01	1.5%	60	85%
Sarcoma/Lymphocele	03	04%	02	03%	-	-	05	07%
Flap necrosis/dehiscence	11	15%	02	03%	02	03%	15	21%
Hematoma	01	1.5%	-	-	-	-	01	1.5%
Lymphodema	23	32%	04	5.5%	01	1.5%	28	40%

Post operative systemic complications

Urinary: 5.5%

Pulmonary: 4.0%

Conclusion

Age more than 60 years, female sex, Smoking, Diabetes mellitus, has significant risk factors for developing wound infection. Oblique incisions are associated with decrease infection of wound complications.

Synchronous surgery of the primary and groin is the risk factor for wound infection. Patients with pathologically positive groin lymph nodes have increased risk of skin flap problems. Malignant melanoma patients had more wound complications than other pathological subtypes.

Radical groin lymph node dissection patients had increase rate of lymphedema. Clinicians should be aware of the indications for surgery, high post operative morbidity and the management of wound complications.

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