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Evaluation of Short Term Complications of Inguinal Lymph Node Dissection for Skin and Urogenital Cancer

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Abstract:

Background: Therapeutic lymphadenectomy is the standard treatment for patients with node positive malignant melanoma, squamous cell carcinoma (SCC) of penis, vulva and lower extremity skin. It has been shown to improve outcomes in some patients. However, inguinal lymph node dissection (ILND) has been associated with significant postoperative morbidity.

Methods: This prospective observational study was conducted in the Departments of Surgical Oncology, Plastic &Reconstructive Surgical Oncology and Uro-Oncology of NICRH, Dhaka for a period of twelve months. A total of 41 patients with skin and urogenital malignancy involving inguinal lymph node undergoing inguinal lymph node dissection were included after getting informed written consent. Socio-demographic profile, cancer status and other related information were collected by preformed questionnaire. All data were analyzed by IBM SPSS v25.

Result: Among all, 58.5% of the patients were aged between 40 to 60 years with male predominance (53.7%). Preoperatively, 78% of the patients had malignant melanoma and 22% of the patients had squamous cell carcinoma. Wound infection (31.7%) was most common complications followed by 22% of the patients had developed wound dehiscence, 22% had developed seroma, 12.2% had flap necrosis, 4.9% had hematoma, 4.9% had lymphadenoma and 2.4% showed graft failure. Older age and cancer status had impact on post-operative outcome but no significant association found (<0.05).

Conclusion: Therapeutic inguinal lymph node dissection remains crucial for managing node-positive melanoma and squamous cell carcinoma, despite its high complication rates. This study at NICRH revealed frequent postoperative morbidities, with wound infection, dehiscence, and seroma being most common. While older age and cancer type influenced outcomes, no statistically significant associations were found.

Key words: Inguinal lymph node, Node positive cancer, Skin and urogenital cancer

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Introduction:

Inguinal Lymph Node Dissection (ILND) is an important component of staging and treatment in different malignancies that can metastasize to this area of the body including penile and vulvar cancers according to National Comprehensive Cancer Network guidelines. 1–4 Additionally, for malignant melanoma and SCC of lower extremity skin lesions draining to the inguinal lymph node basin, ILND has been advocated for cancers with a positive sentinel lymph node biopsy.5 ILND is

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performed via an open incision which was associated with a high incidence of morbidity including skin edge necrosis, wound dehiscence, infection, lymphocele, lymphorrohea, femoral vessel and femoral nerve injury, deep vein thrombosis, and chronic extremity lymphedema. Reported complication rates range from 50% to 90% with a significant impact on quality of life, potentially limiting utilization of recommended ILND for oncologic indications.1,6–8 The incidence, risk factors, and costs associated with wound complications and lymphedema in melanoma patients undergoing inguinal lymph node dissection (ILND) was assessed by previous study.8 In spite of having troublesome complications, therapeutic lymphadenectomy is the standard treatment for patients with node-positive melanoma and has been shown to improve outcomes in some patients.8–12 However, inguinal lymph node dissection (ILND) has been associated with significant postoperative morbidity including infections, skin flap complications, and lower extremity lymphedema and often leads to extended length of hospitalization, reduced quality of life, and delayed return to normal activities. It often leads to extended period of hospitalization, poor quality of life, and delayed return to normal activities.13 Some studies have noted the incidence of short-term (30-day) and long term (beyond 30-day) morbidity to be as high as 75%.8,13–16 Previous studies on ILND have primarily been retrospective in design and have reported various risk factors for postoperative complications, including medical comorbidities, pre-existing surgical incisions, obesity, and locally advanced disease.17,18 The aim of the present study was to review our experience of routine ilioinguinal dissection for all patients presenting with palpable metastatic melanoma in the groin and to provide a contemporary review of the postoperative complications of ILND conducted in a tertiary care hospital of Bangladesh which deals only with cancer. We also aimed to determine the prognostic factors that best predict these complications such that they can be taken into account and optimized in the management of future patients with cancer.

Materials and methods:

Study design: This was a prospective observational study conducted in the Department of Surgical Oncology, National Institute of Cancer Research & Hospital (NICRH), Mohakhali, Dhaka. The study was conducted for a total period of 12 months from 1st January to 31st December, 2023. All patients with a primary skin or urogenital cancer who underwent therapeutic inguinal lymph node dissection with clinically or cytologically proven inguinal lymphadenopathy in Department of Surgical Oncology, NICRH were taken as study sample. Patients with prior neoadjuvant therapy, metastatic disease or other cause of lymphadenopathy were excluded from the study. All patients were enrolled after explaining the objective and nature of the study and taking informed written consent.

Data collection*:* Demographic characteristics, clinical and pathological data, operative variables and postoperative outcome variables were collected in a preformed data collection sheet. Histopathological analysis was done from the resected specimen. All data were preserved in hard and soft copies for further reference and analysis.

Statistical analysis: All collected data were entered and analysed with IBM SPSS Statistics 25. Data were compiled, edited, managed and plotted in tabular and figure form. Continuous data was presented as means ± standard deviations and categorical data was presented as frequency and percentage. To see the association Chi-square test and Fisher Exact test were done. Data entry and analysis was done using SPSS for windows version 25. A 'p' value less than 0.05 was considered significant.

Results:

A total of 41 patients with skin and urogenital malignancy involving inguinal lymph node undergoing inguinal lymph node dissection was enrolled in the study. Among them 22 (53.7%) were male. About 59% of the patients were aged between 40 to 60 years followed by 24.4% were above 60 years and 17.1% were below 40 years. Majority (43.9%) of the patients had BMI 18 to <25 kg/m^2 followed by 39% had 25 to 30 kg/m^2 and 17.1% had BMI <18kg/m^2. Primary location was lower limb in 35 (85.4%) patients and external genitalia in 6 (14.6%) patients. Among them, 78% had malignant melanoma while 22% had squamous cell carcinoma (SCC). During surgery, lazy S incision was performed in 85.4% of the lesion followed by Groin incision was performed in 12.2% and vertical incision was performed in 2.4% of the lesion. Overall, 25 (61%) patients developed one or more postoperative complications. Among them, 31.7% had developed wound infection, 22% of the patients had

developed wound dehiscence and 22% had developed seroma followed by 12.2% had flap necrosis, 4.9% had hematoma, 4.9% had lymphedema and 2.4% showed graft failure. No significant association was found between socio-demographic factors with post-operative complications (Table I). Among 32 malignant melanoma cases 18 showed post-operative complications whereas among 9 SCC cases 7 cases showed post-operative complications. All the cases with tumor in external genitalia and incision by Groin or vertical, showed post-operative complications. But none of these associations ere found statistically significant (Table II).

Table-I

Association of sociodemographic factors with post-operative complications (n=41)

	Complicationsn (%)	No complicationsn (%)	p-value
Age group			
<40	4 (16)	3 (18.8)	1.00**
40 to 60	15 (60)	9 (56.3)	
>60	6 (24)	4 (24.9)	
Gender			
Male	12 (48)	10 (62.5)	0.522*
Female	13 (52	6 (37.5)	
Smoker	9 (36)	6 (37.5)	1.00*
Diabetes mellitus	10 (40)	8 (50)	0.748*
BMI (kg/m^2)			
<18	5 (20)	2 (12.4)	0.913**
18 to <25	11 (44)	7 (43.8)	
25 to 30	9 (36)	7 (43.8)	

Table-II

Association of nature of cancer and incision type with post-operative complications (n=41)

Complicationsn (%)	No complicationsn (%)	p-value*	
Type of primary lesion			
Malignant melanoma	18 (72)	14 (87.5)	0.441
SCC	7 (28)	2 (12.5)	
Location of tumor			
Lower limb	19 (76)	16 (100)	0.065
External genitalia	6 (24)	0 (0)	
Type of incision			
Lazy 'S'	19 (76)	16 (100)	0.097
Groin	5 (20)	0 (0)	
Vertical	1(4)	0 (00	

* p-value was determined by Fischer's exact test

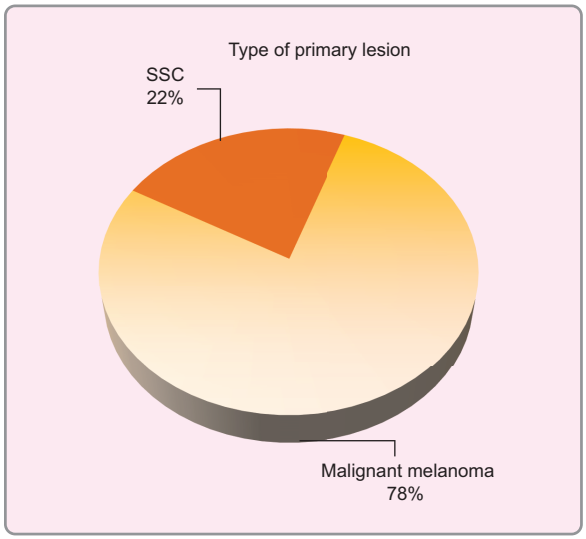

Figure 1: *Distribution of the patients according to the type of lesion (n=41)*

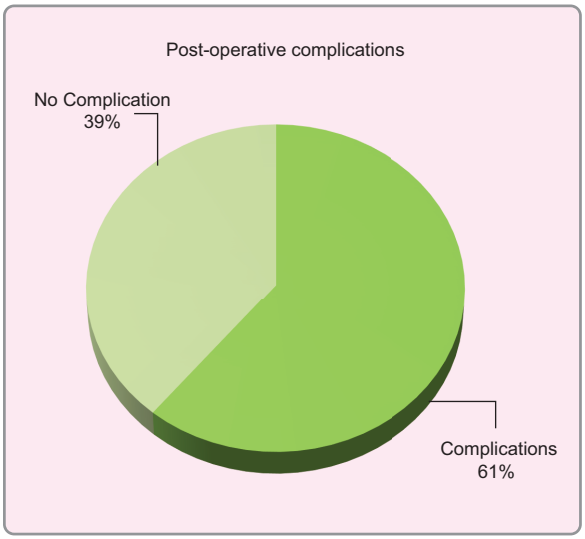

Figure 2: *Distribution of the patients according to the post-operative complications (n=41)*

Discussion:

Dissection of the inguinal lymph nodes (ILND) is a crucial step in the staging and management of various malignancies that have the potential to spread to the part of the body.6 Inguinal lymphadenectomy has always been associated with a high complication rate, mostly related to wound healing.1,17 This high complication rate significantly impacts the quality of life and theoretically restricts the application of recommended lymphadenectomy for oncologic indications.1 For an inguinal lymphadenectomy, the optimal incision is one that would allow sufficient exposure with minimum wound complication.29 Over time, various modifications to treatment protocols have been examined in relation to their impact on the development of wound complications following an ILND. Current study was aimed to assess the complications after inguinal Lymph node dissection. A total of 41 patients with skin and urogenital malignancy involving inguinal lymph node undergoing inguinal lymph node dissection was enrolled in the study.

In this study, 58.5% of the patients were aged between 40 to 60 years followed by 24.4% were above 60 years and 17.1% were below 40 years and 53.7% of the patients were male. Mahmoodzadeh also observed male predominance (53.1%) in their study with an overall mean age of 57.3 years.30 Taher et al. reported a mean age of 56.58 ± 9.51 year (range 30-77 years) with equal gender prevalence.17 Fault et al. observed median age of the patients was 56 years.23 In another study, mean age was 56 years (range 41–81 years), with a male-to-female ratio of 1:1.75.18

In this study, 78% of the patients had malignant melanoma and 22% of the patients had squamous cell carcinoma. This was consistent with the previous study by Nabavizadeh et al.1 Elbalka et al. also observed majority of the patients had SCC followed by melanoma and others.31

Among all the patients 61% of the patients had developed post-operative complications. Previous study by Tsaur et al. complication rate of was 54.4% among the patients.24 In the study of Gopman et al. among 327 patients with penile cancer, 181 (55.4%) had a postoperative complication.32 Spiess et al. found complications rate among diagnostic and therapeutic ILND was 46% and 56% respectively.6 Previous study by Taher et al. complications occurred in only 25.6% which was lower than current study.17 Greater extent of lymph node dissection is required due to a wider affected area and this might be the reason why higher events of complications were developed.

Among all, superficial surgical site infection was the most common complication (31.7%). Other complications included wound dehiscence (22%), seroma (22%), flap necrosis (12.2%), hematoma (4.9%), lymphadenoma

(4.9%) and graft failure (2.4%). Another similar study also observed that majority of the complications were wound related.6 Tsaur et al. mentioned wound infection, lymphocele/seroma and lymphedema as the commonest complication in their study.24 Another study divided the complications into early (wound infection, seroma and wound breakdown) and late (lymphadenoma and cellulitis).29 Taher et al. also observed wound infection was the most common complication followed by flap necrosis, lymphadenoma, seroma and abscess.17

According to current study, older age and increased BMI group had developed more complications. Besides, among 32 malignant melanoma cases 18 showed postoperative complications whereas among 9 SCC cases 7 cases showed postoperative complications. As sample size of the present study was lower, no statistically significant association was found. Hinten et al. also revealed that patient characteristics, extension of surgery and postoperative management influenced short- and/or long-term complications after inguinofemoral lymphadenectomy in SCC patients.33 In another study, 30-day wound complications were noted in 77.4% of patients whereas BMI e" 30 increased the risk for wound complications, while advanced nodal disease approached significance. But other risk factors, including diabetes, smoking, and the addition of a deep pelvic (iliac/obturator) dissection to ILND, were not significant.8 Previous another study suggested that superficial with deep ILND, obesity, and diabetes were significantly associated with wound complications.34 Prognostic factors were identified by Hughes et al., including the number of superficial lymph nodes involved and the existence of extracapsular spread. Explanations that have been proposed for the increased incidence of wound complications associated with ILND include greater lymphatic flow in the inguinal nodes compared with axillary or cervical nodes, greater surface area associated with the dissection, relatively poor vascular supply to the skin and subcutaneous tissues in the region, surgical technique related to the relatively thin skin flaps routinely employed in ILND, density and pathogenicity of the flora of the inguinal region, and difficulty maintaining hygiene in this region, particularly in obese patients.5,35

Conclusion:

The most common complication was wound infection, wound dehiscence and seroma followed by flap necrosis, hematoma, and lymphedema and graft failure. Older age, BMI, cancer characteristics had effect on post-operative outcome. Performance of ILND should not be postponed out of fear of complications. The morbidity and quality of life of impacted patients can be enhanced with careful planning, Proper patient selection, meticulous dissection and appropriate wound care and timely treatment of the complications; these may represent a viable strategy for lowering complications.

Authors' contributions:

Dr. MAS was involved in the study design, data collection, data analysis and interpretation and manuscript preparation. Prof. MJK was involved in the study design and mentoring. Dr. AR and Dr. RA were involved in data collection and manuscript preparation. All authors read and approved the final manuscript.

Conflict of interest:

There is no potential conflict of interest.

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