Wound Complications after Inguinal lymph node dissections for Penile cancers.

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Abstract

Background: Penile cancer in higher stages are treated by inguinal lymph node dissection (ILND). However, ILND is frequently associated with its morbidity of wound complication rates. Wound infection, seroma, skin-flap necrosis, and wound dehiscence are some of early complications. The aim of this study is to investigate the incidence, risk factors, management strategies, and impact on patient outcomes of wound complications after ILND for penile cancer.

Materials and Methods: Data of 30 consecutively enrolled patients with penile cancer admitted in department of Surgical Oncology, Urology Unit at B. P. Koirala Memorial Cancer Hospital who underwent ILND during the period form 15th May 2024 to 15th December 2024 were included in the study. The different variable like baseline patient characteristics: age, history of diabetes, smoking, chronic obstructive pulmonary disease (COPD), Hypertension and American Society of Anesthesiologist (ASA) score were reviewed and recorded. The intraoperative and postoperative parameters like Operative time, length of stay, deep venous thrombosis, wound infection, skin-flap problems, and lymphocele were reviewed and recorded. Data was collected and analyzed using SPSS version 25.

Result: Total 30 patients of penile cancer underwent Open ILND during the period. Total 22 (73.33%) patients developed some form of wound complications after ILND. Among them, 16 (53.33%) patients developed minor skin edge necrosis, 10 (33.33%) patients had wound infection, 5 (17%) patients subsequently developed some degree of wound dehiscence and 1 (3.33%) patient had postoperative hematoma.

Conclusion: Inguinal Lymph Node Dissection for the management of penile cancer is associated with high rate of wound complications secondary to wound infection, wound dehiscence, lymphocele, lymphedema and hematoma

Keywords: Penile Cancer, Inguinal Lymph Node Dissection, Wound Complications, Lymphocele

Introduction

Penile cancer is a rare disease in Developed world accounting for <1% of cancers in men, however, it has been an alarming public health concern in the low and middle income countries, reaching up to 10%.[1] The peak age of incidence is around the sixth decade. Invasive penile cancer is an aggressive disease with a high risk of metastasis. So the local treatment of penis has to be adapted

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as per tumor extension in the vicinity and nodal status.[2] Depending on the stage of Penile cancer, inguinal lymph node dissection (ILND) is the integral part of the treatment. For sure, this operation is associated with very high wound complication rates .[3]

Inguinal lymph nodes are the key landing sites for metastases in penile cancers. In individuals with intermediate or high-risk penile cancer (≥ pT1 G2), even in clinically non palpable inguinal lymph nodes, the probability of micro-metastasis is about 25%. A surgical lymph node staging utilizing inguinal lymphadenectomy is advised for these patients.[4] To prevent these patients from morbidity, dynamic sentinel node biopsy or modified (limited) inguinal lymphadenectomy are performed as deemed possible. In patients with clinically suspicious (palpable or visible) inguinal lymph nodes, a standard inguinal lymphadenectomy is advised.[5]

Despite being a relatively simple operation, ILND has more wound complication rates. Wound infection, seroma formation, skin-flap necrosis, and wound dehiscence are some of the short-term problems. The reported rate of early postoperative wound complications varies significantly in the existing literature; however, it can reach as high as 70%. Lymphedema of the leg and/or genital area can occur in varied degrees over a longer period of time.[6]

The aim of this study is to investigate the incidence, risk factors, management strategies, and impact on patient outcomes of wound complications after ILND for penile cancer. Understanding the incidence, risk factors, and management strategies for these complications is essential for optimizing patient outcomes and refining surgical approaches. Conducting prospective research on wound complications after ILND for penile cancer is imperative for advancing our understanding of this critical aspect of surgical care.

Material and Methods

Data of 30 consecutively enrolled patients with penile cancer admitted in department of Surgical Oncology, Urology Unit at B. P. Koirala Memorial Cancer Hospital who underwent ILND during the period form 15th May 2024 to 15th December 2024 were included in the study. After taking ethical clearance from Institutional Review Committee (IRC) of BPKMCH, this prospective observational study was conducted. All the clinical data were recorded and analyzed. The different variable like Baseline patient characteristics: age, history of diabetes, smoking, chronic obstructive pulmonary disease (COPD), hypertension and American Society of Anesthesiologist (ASA) score were reviewed and recorded.

The intraoperative and postoperative parameters like Operative time, length of stay, deep venous thrombosis, wound infection, skin-flap problems, and lymphocele were reviewed and recorded.

All data were expressed as mean, median, standard deviation or frequency and percentages. Data was collected and analyzed using SPSS version 25.

Operative Procedure: Patient with the biopsy proven penile carcinoma (≥ pT1 G2) underwent surgery of primary penile lesion followed by Inguinal Lymph Node dissection. The primary penile surgery was performed in the form of glansectomy or partial penile amputation or total penile amputation depending upon the location and extent of the lesion.

The inguinal lymph node dissection was indicated in patients with palpable inguinal lymph nodes. The dissection was limited superiorly by a line drawn from margin of the external ring to the anterior superior iliac spine, laterally, by a line drawn from the anterior superior iliac spine extending 20 cm inferiorly, and medially by a line drawn from the pubic tubercle 15 cm down the medial thigh. The superficial and deep inguinal lymph nodes were dissected. Saphenous veins was preserved as far as possible.

Result

Total 30 patients with penile cancer underwent o pen ILND. Median age of patient was 54 years (38-79) years. Twelve (40%) patients were

smokers. Six (20%) patients were found to have Diabetes Mellitus. Ten (33.33%) patients were Hypertensive. Three (10%) patients were COPD. Sixteen (53.33%) patients were found to have ASA grade I while nine (30%) patients had ASA grade II. Only five (16.67%) patients had ASA grade III on presentation.

The mean operative time of bilateral ILND was 76 ± 14 minutes. Simultaneous bilateral PLND was performed in only one case who had imaging documented pelvic node enlargement.

Total 22 (73.33%) patients developed some degree of wound complications after ILND. Sixteen (53.33%) patients had minor skin edge necrosis, 10 (33.33%) patients had wound infection, 5(16%) patients subsequently developed to full or partial wound dehiscence and 1 (3.33%) patient developed postoperative hematoma requiring re-exploration. None of the patients developed DVT.

Discussion

This study indicates that despite being simple surgery, and even in a high-volume specialized center, ILND has complications in considerable numbers. The total wound complications including minor and major totaled to be 73.33% in this study. Breaking it down in components, 53.33% has skin edge necrosis, 33.33% infection, among which 16 % developed into some wound dehiscence. One patient required hematoma evacuation.

Spiess et al., in their study of 43 patients found overall complication of 49% following ILND. They observed 9% wound infection rate, 11% wound dehiscence rate, 2% lymphocele rate and 17% lymphedema.[7] Stuiver et al., in their study 58% of complication rate following 237 ILNDs in 163 patients with penile cancer. The severe complication was found in 10% of these patients. Wound infections (43%), seroma development (24%), and skin-flap issues (16%), were reported.[6]

Gopman et al., in their study of 327 patients with penile cancer found overall complication rate of 55% following ILND. Major and minor complications were seen in 35% and 20% respectively. In their study, wound infection rate was 32%, rate of lymphocele was 8% and rate of lymphedema was 22%.[8]

The discrepancy of reported complications rate in all these studies may be due to underreporting in the medical files. The broad definition of wound infection in various studies might have over-estimated the infection rate. Nonetheless, none of the complications were life threatening.

In order to minimize wound dehiscence and skin necrosis, knowledge of vascular anatomy of skin of groin is important. The physiological incision of skin parallel to natural skin fold with optimal flap thickness reduces these complications.[9] The rate of complications can be remarkably reduced by using modified ILND techniques in place of radical lymphadenectomy.[10] Catalona was first to propose modified ILND. The femoral artery laterally, the abductor longus muscle medially, and the inguinal ligament with the fossa ovalis as the superior and inferior limits, respectively, are the boundaries of the modified inguinal lymphadenectomy.[11] It narrows the field of lymph node dissection and also allows smaller skin incision. Preservation of saphenous vein and avoidance of sartorius interposition in modified ILND compared to radical ILND reduce the rate of lymphedema.[12] Lymphatics control using absorbable sutures or titanium clips or advanced bipolar tissue sealing system also prevent lymphocele.[13] Pneumatic compression device, pressure stockings, elastic stockings, physical therapy, and early ambulation have all been recommended as other measures to lessen the risk of lower extremity lymphedema.[8] DVT is prevented by early ambulation. For those patients with history of DVT, low molecular weight Heparin is administered perioperatively until postoperative day 28. To prevent vascular complications, proper saline irrigation uncovers any potential unrecognized bleeding during ILND.[14]

Recent studies have shown that minimally invasive techniques, such as robotic assistance and Video Endoscopic Inguinal Lymphadenectomy

(VEIL), can reduce surgical morbidity associated with inguinal lymphadenectomy.[15]

Conclusion

Inguinal Lymph Node Dissection for the management of penile cancer is associated with high rate of wound complications like skin edge necrosis, wound infection, wound dehiscence, lymphocele, lymphedema and hematoma. These complications can be minimized by surgical technique modifications such as dissection templates, saphenous vein sparing, and thicker skin flaps, perioperative management methods, patient selection, and surgical procedure.

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