Original Article

Suture flap fixation reduces lymphatic drainage after inguinal node dissection in penile cancer patients

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Keywords:
penile cancer,
inguinal lymph node dissection,
suture flap fixation,
seroma formation

Abstract

Objective: This study assessed the impact of the suture flap fixation technique in decreasing the time to drain removal and wound complications in penile cancer patients undergoing inguinal lymph node dissection.

Material and method: This study assessed (n=58) the surgical sites of penile cancer patients who underwent inguinal lymph node dissection for squamous cell carcinoma of the penis between 2011 and 2016 in Buriram Hospital. The study compared with the suture flap fixation technique in which the skin flap is sutured to the fascia at the floor of the operative site with standard inguinal lymph node dissection. At the end of the procedure a closed suction drain was routinely placed in the groin. The primary outcome was to compare the time to drain removal in both groups.

Result: A total 58 surgical sites of surgical lymph node dissection using the suture flap fixation technique (n=31) and the standard inguinal lymph node dissection only (n=27) were enrolled. Mean duration of time to drain removal was significantly reduced in the suture flap fixation technique group compared with the standard technique only group (5.9$\pm$2.6 days versus 8.7$\pm$3.1 days p 0.001). No statistically significant differences were observed for operative time and the following postoperative complications: infection, seroma formation, and skin flap problems in the two groups.

Conclusion: Suture flap fixation technique resulted in a significant reduction in the time to drain removal of inguinal lymph node resection in penile cancer patients

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นิพนธ์ต้นฉบับ

การลดระยะเวลาการใส่สายระบายหลังการเลาะต่อมน้ำเหลืองขาหนีบในผู้ป่วยมะเร็งองคชาตด้วยวิธีการเย็บตรึงผิวหนัง

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คำสำคัญ:
มะเร็งองคชาต,
การผ่าตัดเลาะต่อมน้ำเหลืองขาหนีบ,
การเย็บตรึงผิวหนังแผลผ่าตัด,
การคั่งของน้ำเหลืองหรือสารน้ำของแผลผ่าตัด

บทคัดย่อ

วัตถุประสงค์: เพื่อประเมินผลของการผ่าตัดด้วยวิธีการเย็บตรึงผิวหนังหลังการผ่าตัดเลาะต่อมน้ำเหลืองขาหนีบในผู้ป่วยมะเร็งองคชาต และประเมินอัตราการเกิดภาวะแทรกซ้อนต่างๆ หลังการผ่าตัด

ผู้ป่วยและวิธีการศึกษา: ศึกษาในผู้ป่วยมะเร็งองคชาตที่ได้รับการผ่าตัดเลาะต่อมน้ำเหลืองขาหนีบจำนวนทั้งสิ้น 58 การผ่าตัด ตั้งแต่ กันยายน 2554 ถึง ตุลาคม 2559 ในโรงพยาบาลบุรีรัมย์ โดยเปรียบเทียบระหว่างการผ่าตัดด้วยวิธีเย็บตรึงผิวหนังกับชั้นเนื้อเยื่อก้นแผลหลังการผ่าตัดเลาะต่อมน้ำเหลืองขาหนีบตามวิธีมาตรฐานเปรียบเทียบกับการผ่าตัดด้วยวิธีมาตรฐานเพียงอย่างเดียว

ผลการศึกษา: การผ่าตัดเลาะต่อมน้ำเหลืองขาหนีบในผู้ป่วยมะเร็งองคชาตจำนวน 58 การผ่าตัด เป็นการผ่าตัดโดยใช้วิธีการเย็บตรึงผิวหนังจำนวน 31 การผ่าตัด และผ่าตัดโดยวิธีมาตรฐานอย่างเดียว 27 การผ่าตัด พบว่าระยะเวลาการใส่สายระบายของการผ่าตัดด้วยวิธีเย็บตรึงผิวหนังมีค่าเฉลี่ยที่ 5.9±2.6 วัน ขณะที่การผ่าตัดวิธีมาตรฐานอย่างเดียวมีค่าเฉลี่ยที่ 8.7±3.1 วัน (p-value 0.001) ส่วนระยะเวลาการผ่าตัดหรือการเกิดภาวะแทรกซ้อนของบาดแผลผ่าตัด เช่น การติดเชื้อ การเกิดการคั่งของน้ำเหลือง และเนื้อเยื่อแผลผิวหนังเน่าตายไม่พบว่ามีความแตกต่างอย่างมีนัยยะสำคัญสำหรับวิธีการผ่าตัดทั้งสองกลุ่ม

สรุป: วิธีการเย็บตรึงผิวหนังหลังการผ่าตัดเลาะต่อมน้ำเหลืองขาหนีบในผู้ป่วยมะเร็งองคชาตสามารถทำให้ลดระยะเวลาการใส่สายระบายหลังผ่าตัดได้อย่างมีนัยยะสำคัญ

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Introduction

Inguinal lymph node dissection (ILND) has been associated with clinically significant postoperative morbidities including infections, lymphedema of leg, and skin flap necrosis, leading to extended hospitalizations and delayed return to normal activities in penile cancer patients.

Currently, closed suction drains are inserted at the time of ILND in order to decrease seroma formation, wound dehiscence, and infection. However, closed suction drains are not without consequence: they require a high level of maintenance, cause discomfort, interfere with mobility, and serve as potential routes of infection when drainage is prolonged. Many techniques have been proposed, for example, prevention of seroma formation: fibrin sealant and ultrasonic scalpel to provide hemostasis and reduce fluid accumulation[1,2]; however, no technique has proven to be superior in seroma reduction or reduction in length of drain usage and operative complications. The suture flap fixation technique seems to prevent seroma formation in breast cancer surgery[3-5]. The suture flap fixation technique has been used in many medical centers for penile cancer, but the benefit has not been demonstrated.

We postulated that applying the suture flap fixation technique in patients undergoing ILND for penile cancer might decrease the time to drain removal for closed suction drains, thereby reducing the incidence of postoperative complications and subsequently improving patient comfort.

The primary objective of the study was to determine whether the suture flap fixation technique following ILND would result in earlier postoperative drain removal. The secondary objective was to determine the postoperative morbidity.

Material and method

We collected the data of all the patients with penile cancer and ILND between 2011-2016 at Buriram Hospital. There were 27 surgical sites that underwent standard ILND only and 31 surgical sites that underwent the suture flap fixation technique following ILND. We collected patient characteristics, cancer stage, operative time, time to drain removal, length of hospital stay, and data on surgical wound complications, which were defined as complications occurring within 30 days after operation. The complications of interest were wound infection, seroma formation, and skin flap problems.

Definition of outcome variables

Time to drain removal: following surgery, the total amount of drain output within 24 hours was measured daily. The drain was removed once the drain output was less than 30 mL/24 hours for 2 consecutive days.

Wound infection was defined as any inflammation of the wound that prompted antibiotic treatment with or without surgical intervention.

Seroma formation was defined as any fluid collection in the wound that required needle aspiration or the reopening of the wound after removing the drain [6,7].

A skin flap problem was defined as any wound dehiscence or skin edge necrosis with or without surgical intervention.

Operative technique

ILND was performed using the standard technique in all patients. Briefly, all connective fat and lymphatic tissue is removed through an incision parallel and 2 cm inferior to the inguinal crease, which is the standard ILND boundary[8]. At the end of the procedure, one single closed suction drain is routinely placed within the groin. A light pressure dressing is done9. The suture flap fixation is sutured with 1/0 nylon through the skin flap to the fascia or muscle at the floor of the surgical site, 2 stitches 2 cm above and 2 stitches below the incision. All patients received perioperative antibiotic until the drain was removed.

Outcomes and statistical analysis

The primary outcome was to compare the time to drain removal between the 2 groups, and the secondary outcomes included comparison of operative time, length of hospital stay, and rate of complications (infection, seroma formation, and skin flap problem).

Demographic data were collected prospectively for all patients and included age, cancer stage, number of lymph nodes harvested, and number of metastatic lymph nodes.

Data were analyzed by an independent sample t test for continuous outcomes and chi-square test for categorical outcomes.

Result

Between September 2011 and October 2016, a total of 58 ILND surgeries were enrolled in this cohort study; 31 surgical sites underwent the suture flap fixation technique and 27 surgical sites underwent the standard ILND only. Patient demographics are demonstrated in Table 1. Mean duration of time to drain removal was significantly reduced in the suture flap fixation technique group compared with the standard technique only group (5.9±2.6 days versus 8.7±3.1days p 0.001). No statistically significant differences were observed for the operative time and the following postoperative complications: infection, seroma formation, and skin flap problems in the 2 groups (see Table 2).

Discussion

The suture flap fixation technique has been used for many years for inguinal lymph node dissection in penile cancer and breast cancer. In breast cancer, the suture flap fixation technique is utilized for decreasing postoperative drainage[10,11]. However, the benefit of the suture flap fixation technique in penile cancer has not been demonstrated. No eligible trials for lymphatic drainage following the suture flap fixation technique have been conducted.

The most frequently employed technique for prevention of seroma formation is closed suction drainage. There have been many publications on the use of closed suction drainage to prevent seroma formation. Closed suction drainage is regarded as a standard treatment for reducing the dead space. However, closed suction drains are not without consequence: they require a high level of maintenance, cause discomfort, interfere with mobility, and serve as potential routes of infection when drainage is prolonged. The suture flap fixation technique prevents seroma formation by obliterating the potential dead space after inguinal node dissection and decreasing leakage from transected lymphatic liked adhesive pressure[1,3,4].

Table 1. Patient characteristics of the 2 studied groups

	Standard operation (n=27)	Suture flap fixation technique (n=31)	p value
Patient age Mean age (years)	54.85 ± 9.6	64.71 ± 11.9	
Cancer stage			
1	2 (7.41%)	0 (0%)	
2	14 (51.85%)	8 (25.8%)	
3	4 (14.8%)	17 (54.8%)	
4	7 (25.9%)	6 (19.4%)	
Number of node resection	7.41 ± 2.39	6.42 ± 2.75	0.15
Number of positive node	2.22 ± 2.51	1.35 ± 1.52	0.12

Table 2. Operative features of the 2 studied groups

	Standard operation (n=27)	Suture flap fixation technique (n=31)	p value
Operative time (minutes)	127.33 ± 37.03	130.02 ±33.61	0.77
Time to drain removal (day)	8.70 ± 3.09	5.96 ±2.61	0.001
Length of hospital stay (days)	15.48 ± 5.84	10.97 ±3.17	0.001
Seroma formation (%)	14.81 ± 6.9	9.7 ±5.4	0.55
Surgical site infection (%)	11.11 ± 3.2	6.45 ±2.4	0.46
Wound dehiscence (%)	3.70 ± 3.7	0.00	0.28
Flap necrosis (%)	3.70 ± 3.7	3.23 ±3.62	0.92

This study demonstrated the suture flap fixation technique for reducing the time to drain removal after ILND in penile cancer patients. This technique is not sophisticated for the surgical team. There was no differentiation in operative time when the suture flap fixation technique was performed after the standard technique for inguinal lymph node dissection.

Conclusion

The finding of this study suggests that the suture flap fixation technique is a valuable procedure that significantly decreases the time to drain removal in patients undergoing ILND for penile cancer. It appears to reduce the length of hospital stay and promote normal life activity for the penile cancer patients after the operation. A prospective trial could further evaluate the effect of suture flap fixation, including long-term outcome measures such as cosmetic and patient satisfaction.

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