

Comparative Study Between Video Endoscopic Inguinal Lymphadenectomy and Open Inguinal Lymphadenectomy Of Carcinoma of Penis

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I. Introduction

Penile carcinoma accounts for 0.4 % to 0.6 % of all malignancies among men in United States and Europe. But it represents up to 10% of malignant neoplasm in men in some Asian African and south American countries (Gloeckler - Ries et al, 1990 Vatanasapt et al, 1995) The reason are unclear but may be related in part to increased attention to personal hygiene. Though incidence is decreasing in past few decades in India, still it is common disease present in Indian males ^[1]

However reports suggest that the incidence of penile cancer is decreasing in many countries, including Finland, The United States, India and other Asian countries (Maiche et al, 1991; Frisch et al 1995: Vatanasapt et al, 1995; yeole and Vussawalla, 1997).

Inguinal lymph nodes involvement is an important cause of morbidity and an important predictive factor for survival in penile cancer patient ^[2,3,4]

Metastasis of penile carcinoma occurs first in the superficial inguinal lymph nodes, and the risk of metastatic disease is related to tumor size. Small tumors found only on the glans and prepuce are rarely metastatic at diagnosis ^[6]. Large tumors that involve more than 75% of the penile shaft have a very high risk of nodal spread ^{[7] [8]}

In high risk patients, elective inguinal lymphadenectomy may offer survival advantage over watchful waiting ^[9,10]. Elective open inguinal lymphadenectomy is the standard of care of patients with large tumor size high histological grade, presence of lymph vascular invasion ^[12, 13]. Studies show that conventional inguinal lymph node dissection is associated with major complications such as lymphocele, skin loss and infections ^[11]

An endoscopic procedure, with small invasion away from the dissecting area, seems to be a new and attractive approach duplicating the standard open procedure with less morbidity ^[14, 14b]

A study done by M.Tobias-Machado; & colleagues on video endoscopic inguinal lymphadenectomy (VEIL): minimally invasive resection of inguinal lymph nodes (7 patients) showed that technique is feasible and allows the radical removal of inguinal lymph nodes in the same limits of conventional surgery dissection. In our study we plan to do video endoscopic inguinal lymphadenectomy (VEIL). In this study we plan to do standard inguinal lymph node dissection (superficial and deep both group of inguinal lymph node) in clinically non palpable inguinal lymph node with primary high grade tumor to assess the feasibility and safety of the surgery.

II. Aims & Objectives

Prospective evaluation of video endoscopic inguinal lymphadenectomy (VEIL) And open inguinal lymphadenectomy of carcinoma of penis.

III. Materia And Methods

Study Design

- *Observational study, Prospective study of VEIL. And open inguinal lymphadenectomy of carcinoma of penis.*

Study Objective

- *Prospective evaluation of cases of Carcinoma penis operated by "VEIL". And open inguinal lymphadenectomy of carcinoma of penis.*

Inclusion criteria:

- a. Cases of carcinoma penis coming to the Department of general surgery and surgical oncology KG Medical University, Lucknow.
- b. Cases of Carcinoma Penis showing high grade tumor on histopathological examination & clinically impalpable inguinal lymph nodes for Video endoscopic inguinal lymphadenectomy (VEIL).

Methods:

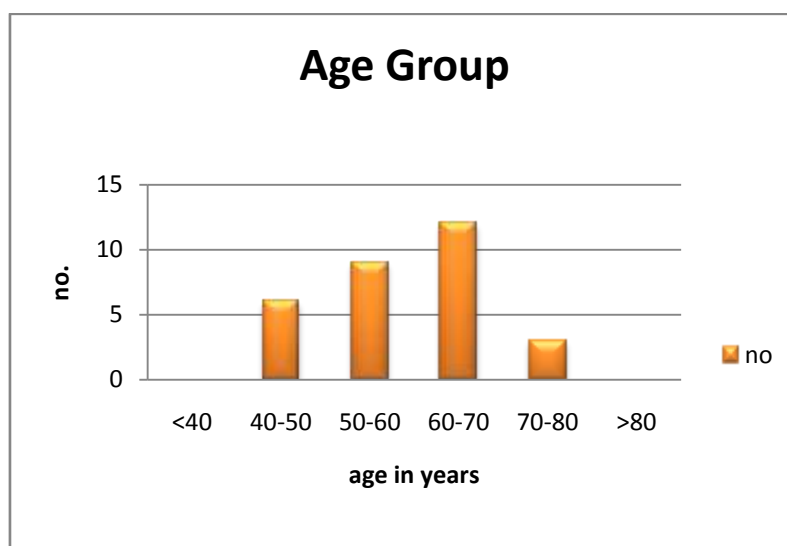
Patients operated for inguinal lymph nodes dissection by VEIL and open inguinal lymphadenectomy:

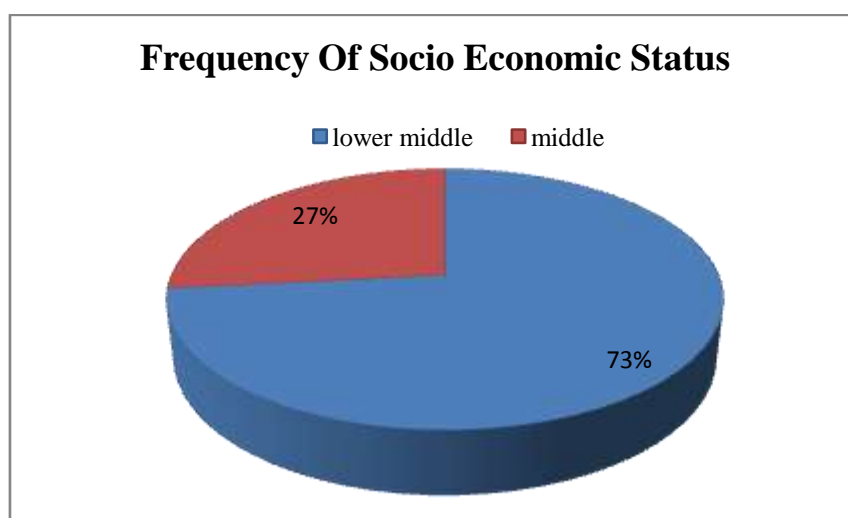
- Enrolment of patients
- Follow of patients operated by VEIL for e.g;
 - a) Operation time
 - b) Hospital stay
 - c) Lymphnode Yeild
 - d) Early post-op morbidity
 - e) Late post-op morbidity

IV. Results And Observation

In our study we have taken 30 patients of carcinoma of penis

- average age of incidence of Carcinoma Penis is 61.33 years with 73 percent patients belong to lower middle class families.
- In our study 60 percent patients were illiterate and 83 percent patients belong to rural areas.
- Patients who were giving history of multiple contacts were 60 percent. No patient was found circumcised.
- 85 percents of our patients were taking tobacco in any form.
- Phimosis was the common complaint associated with our patient's problem with percentage of 63.
- 20 percent patients were giving history of urinary complaints which was mainly obstructive in nature due to the lesion and phimosis.
- No patients were giving history of any bony complaints.
- 16 percent of patients were having painful lesions and 13 percent patients were having discharging lesions which was mainly serous.
- Growth type which we found in our patients were mainly fungating type and present in 80 percent of patients and mostly involved part of our disease was glans which was about 53 percent.
- 1 patient was showing signs and symptoms of distant metastasis in the form of involvement of lung.
- High resolution Ultrasonography of abdomen and pelvis showed bilateral inguinal lymphadenopathy in 43 percent of patients.
- 70 percent of our patients needed partial penectomy.
- out of which
 - 1) 15 patients operated for B/L Open lymphadenectomy
 - 2) 7 patients operated for Lt VEIL RT
 - 3) 8 patients were operated for Right VEIL





EDUCATION LEVEL					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Graduate	3	10.0	10.0	10.0
	Illiterate	18	60.0	60.0	70.0
	litterate	9	30.0	30.0	100.0
	Total	30	100.0	100.0	

Residence					
	Residence	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Rural	25	83.3	83.3	83.3
	Urban	5	16.7	16.7	100.0
	Total	30	100.0	100.0	

RISK FACTORS FOR CARCINOMA PENIS								
	H/o Multiple contacts	Circumcision	Tobacco consumption	Phimosis	Urinary complaints	Bony pain	Pain	Discharge
+	18	0	26	19	6	0	5	4
-	12	30	4	11	24	30	25	26

	Site of lesion	Percent	Valid Percent
Glans	16	53.3	53.3
Glans+prepuce	10	33.3	33.3
Glans+shaft	1	3.33	3.33
Prepuce	1	3.33	3.33
Shaft	2	6.67	6.67
Total	30	100	100

- a. We have taken 15 patients in our study who were perfect candidates for video endoscopic inguinal lymphadenectomy with non palpable inguinal lymphnodes but having high grade Squamous Cell Carcinoma of Penis. We have recorded that...
 - 8 patients were operated for Right VEIL and 7 patients operated for Lt VEIL RT
 - the average operative time for video endoscopic inguinal lymphadenectomy was 136.15 minutes \pm 20.3 minutes with no significant intra operative complications.
 - Average lymphnode yield was 8.3 \pm 2.28. When we discussed about perioperative complications.
 - We found that no patient were having any skin complications like necrosis or infection but infraumbilical surgical emphysema was present in every patient which resolved spontaneously.
 - Subcutaneous edema was present in 05 patients. Lymphocele were found in 3 patients. No patient was showing lymphorrhoea.

- Average hospital stay after video endoscopic inguinal lymphadenectomy was 7.23 days \pm 0.83 days.
- In our study 10 patients showed negative lymph node for malignant cells for whom this procedure seems to be diagnostic and 3 patients showed positive lymph nodes for malignant cells.

b. We have taken 15 patients in our study who were operated for bilateral open inguinal lymphadenectomy but having high grade Squamous Cell Carcinoma of Penis. We have recorded that...

- Average operative time in open lymphadenectomy is 117.4 minutes
- most common intraoperative complication was moderate Haemorrhage seen in 33% of cases.
- Average lymphnode yield was 8.0 ± 2.02
- Average hospital stay after bilateral open inguinal lymphadenectomy was 12.23 days \pm 0.5 days.
- most common post operative complication in Bilateral open lymphadenectomy was skin edema seen in 9 patients followed by skin necrosis in 6 patients.
- skin infection was found in 4 cases .Lymphocele in 3 cases and lymphorrhea in 2 cases.
- Recurrence was seen in 2 cases operated for Bilateral open lymphadenectomy

V. Discussion

- Penile cancer is a disease of older men, with an abrupt increase in incidence in the sixth decade of life and a peak around 80 years of age (Persky, 1977). In two studies, the mean age was 58 years (Gursel et al, 1973) and 55 years (Derrick et al, 1973). The tumor is not unusual in younger men; in one large series, 22% of patients were younger than 40 years and 7% were younger than 30 years (Dean, 1935); the disease has also been reported in children (Kini, 1944 ; Narasimharao et al, 1985). Our study showed average age 61.33 years with no patient younger than 45 years.
- Neonatal circumcision has been well established as a prophylactic measure that virtually eliminates the occurrence of penile carcinoma because it eliminates the closed preputial environment where penile carcinoma develops. The chronic irritative effects of smegma, a byproduct of bacterial action on desquamated cells that are within the preputial sac, have been proposed as an etiologic agent. Although definitive evidence that human smegma itself is a carcinogen has not been established (Reddy and Baruah, 1963), In our study every patient was uncircumcised.
- Penile trauma may be another risk factor for penile cancer. The development of carcinoma in the scarred penile shaft after mutilating circumcision has been reported as a distinct entity (Bissada et al, 1986). Further, Maden and colleagues (1993) found a greater than threefold risk of penile cancer in men with penile tears and rashes. A case-control study also revealed an odds ratio of 18:1 for the development of penile cancer for those men reporting a penile injury 2 years before the onset of the disease (Hung-fu et al, 2001). In our study no patient were giving history of local Trauma before lesion starts.
- Although neonatal circumcision and good hygiene to prevent the occurrence of phimosis represent important prevention strategies, additional efforts to prevent malignant transformation include avoidance of HPV infection, ultraviolet light exposure, and tobacco products. Thus, modifiable behaviors can potentially prevent penile cancer (Munger et al, 1989 ; Maden et al, 1993 ; Harish and Ravi, 1995 ; Levi et al, 1998 ; Griffiths and Mellon, 1999). In our study 85% patients were consuming tobacco in any form and 85% patients were giving history of poor local hygiene.
- It is the penile lesion itself that usually alerts the patient to the presence of penile cancer. The presentation ranges from a relatively subtle induration or small excrescence to a small papule, pustule, warty growth, or more luxuriant exophytic lesion. It may appear as a shallow erosion or as a deeply excavated ulcer with elevated or rolled-in edges. Phimosis may obscure a lesion and allow a tumor to progress silently. Eventually, erosion through the prepuce, foul preputial odor, and discharge with or without bleeding call attention to the disease. In our study 63% patients were having phimosis.
- Penile tumors may present anywhere on the penis but occur most commonly on the glans (48%) and prepuce (21%). Other tumors involve the glans and prepuce (9%), the coronal sulcus (6%), or the shaft (<2%) (Sufrin and Huben, 1991). This distribution of lesions may be due to constant exposure of the glans, coronal sulcus, and interior prepuce to irritants (e.g., smegma, HPV infection) within the preputial sac, whereas the shaft is relatively spared. In our study 53% lesions were present over glans, 33% lesions involved both glans and prepuce and 7% lesions involved shaft only.
- Confirmation of the diagnosis of carcinoma of the penis and assessment of the depth of invasion, the presence of vascular invasion, and the histologic grade of the lesion by microscopic examination of a biopsy specimen are mandatory before the initiation of any therapy. This provides insight into the therapeutic options for treatment of the primary lesion as well as the likelihood of nodal metastases in patients with no palpable adenopathy (McDougal, 1995 ; Lopes et al, 1996 ; Theodorescu et al, 1996). In our study 100% lesions were Squamous Cell Carcinoma by histopathology.

- Penile amputation remains the standard therapy for patients with invasive carcinoma. Partial or total penectomy should be considered in patients exhibiting adverse features for cure by organ preservation strategies. These are consistently associated with tumors of size 4 cm or more, grade 3 lesions, and those invading deeply into the glans urethra or corpora cavernosa (Mohs et al, 1992 ; Gotsadze et al, 2000 ; Kiltie et al, 2000). In our study every patient required penile amputation.
- The reluctance to advocate “automatic” ilioinguinal lymphadenectomy in all patients with penile cancer stems from the substantial morbidity the procedure can produce, as opposed to the relatively limited postoperative morbidity of pelvic or retroperitoneal lymphadenectomies. Early complications of phlebitis, pulmonary embolism, wound infection, flap necrosis, and permanent and disabling lymphedema of the scrotum and lower limbs were frequent after both inguinal and ilioinguinal node dissections (Fig. 31-2) (Skinner et al, 1972 ; Johnson and Lo, 1984b ; McDougal et al, 1986 ; Fraley et al, 1989). Postoperative complications have been reduced by improved preoperative and postoperative care; advances in surgical technique; plastic surgical consultation for myocutaneous flap coverage; and preservation of the dermis, Scarpa's fascia, and saphenous vein as well as modification of the extent of the dissection (Catalona, 1988 ; Colberg et al, 1997 ; Bevan-Thomas et al, 2002 ; Coblenz and Theodorescu, 2002 ; Nelson et al, 2004) (Fig. 31-3). In The University of Texas M. D. Anderson Cancer Center experience, both the incidence and severity of lymphedema and skin edge necrosis were significantly decreased (Bevan-Thomas et al, 2002).

Lymphadenectomy Complications in Four Surgical Series

	Johnson and Lo (1984a)	Ravi (1993a)	Ornellas et al (1994)	Bevan-Thomas et al (2002)
Number of dissections	101	405	200	106
Period	1948-1983	1962-1990	1972-1987	1989-1998
Complications (%)				
Skin edge necrosis	50	62	45	8 ^[*]
Lymphedema	50	27	23	23 ^[†]
Wound infection	14	17	15 ^[‡]	10
Seroma formation	16	7	6	10
Death	0	1.3	Not stated	1.8

- From Bevan-Thomas R, Slaton JW, Pettaway CA: Contemporary morbidity from lymphadenectomy for penile squamous cell carcinoma: The M. D. Anderson Cancer Center experience. *J Urol* 2002;167:1638-1642.

* Significantly lower than in the three other reported series (all P < .0001).
 † Significantly lower than in the series of Johnson and Lo (P < .0001).
 ‡ Incidence among 85 lymphadenectomies performed by Gibson-type incision.

- Video endoscopic inguinal lymphadenectomy (VEIL): initial case report and comparison with open radical procedure. Study done by Tobias – Machado M, Taaeres A, Molina WR Jr., Zambon JP, Medina JA, Forseto PH Jr., Juliano RB, Wroclawski ER, Section of Oncology & Laparoscopy, Institute of Urology. ABC Medical School Santo Andre, SP Brazil.
- The above study showed average operative time 130 minutes for VEIL with eight lymphnode yield average with no skin complications follow-up, with no signs of disease progression were noted. In our study performed on VEIL showed average operative time 136 minutes average lymphnode yield 8.3, average Hospital stay 7.23 days, with 0% skin complications, but 05 patients showed subcutaneous edema 03 patients developed lymphocele.
- in our study operative time taken for VEIL is 136 minutes and for open lymphadenectomy is 117 min. Therefore VEIL takes more time then open approach
- average hospital stay in VEIL surgery is 7 days as compared to open lymphadenectomy which is 12 days. (statistically significant)
- There was no skin complication in VEIL but surgical Emphysema was present in almost all cases which was subsided in few days
- however skin edema followed by skin infection was present in 9 and 6 cases respectively in patients operated by open lymphadenectomy.
- Lymph node yield was statistically similar in both approach.

Comperative Chart Between Tobas Machado V/s Our Study on VEIL			
	Tobias - Machado Study on VEIL	Our Study on VEIL	Our study on B/L open lymphadenectomy
No. of Patients	7	15	15
Average Operative Time	130 Minutes	136 Minutes	117 minutes
Hospital stay in days	Not studied	7 days	12 days
Lymph node Yeild	8	8.3	8
Skin Necrosis	0	0	6
Skin Infection	0	0	4
Edema	0	5	9
Lymphocele	0	3	3
Lymphorhea	0	0	2
Surgical Emphysema	7	13	0

Comparison

Operative time

t = 3.189

p = 0.0029

is clinically significant (More for VEIL)

Hospital stay

t = 3.179

p = 0.0029

is clinically significant (Less for VEIL)

Lymphnode Yeild

t = 1.019

p = 0.2822

is clinically in-significant

VI. Conclusion

This preliminary study suggests that VEIL can reduce morbidity, including hospitalization times, compared with standard open surgery. It allows the radical removal of inguinal lymph nodes within the same limits of conventional surgical dissection and potentially reduces surgical morbidity. VEIL has the potential to become the minimally invasive procedure for low volume inguinal lymph node disease and prophylactic inguinal lymph node dissection but long term studies with a greater number of patients are needed.

Bibliography

- [1]. Misra S, Chaturvedi A, Misra NC: Penile Carcinoma, a challange for the developing world, Lancet Oncel 2004, 5:240-247
- [2]. Srinivas V, Morse MJ, nerr HW et al: Penile Cancer: Relation of extant of nodal metastasis to survival. J Urol 1987, 137:870-82
- [3]. Ficarra V, Zaltoni F, Cunico SC, et al: lymphatic and vascular embolizations are independent predictive variables. Inguinal lymph node involvement in patients with squamouscell carcinoma of the penis: Gruppo Urooncologica del Nord EST (Northeast Uro - oncological Group) Penile cancer data base data. Cancer 2005, 103:2507-2516.
- [4]. Or nellas AA, Seixas AL, Marota A et al: Surgical treatment of invasion squamous all carcinoma of the penis retrospective analysis of 350 cases. J Urol 1994, 151:1244 - 1249
- [5]. Mukamel E, de Kernion JB: Early vs late lymphnode dissection vs no lymphnode dissection in carcinoma of the penis Urol Clin. North Am 1987; 14:707-711
- [6]. Farly EE, Zhang G, Sazama R, Lange PH: Cancer of the penis prognosis and treatment plans, cancer 1985; 55:1618 - 1624
- [7]. Stanbitz W, Melbourne H, oberkircher O: Carcinoma of the penis cancer 1995; 8:371-378
- [8]. Kroon BK, Horenblas S, Lont AP, et al; Patients with penile carcinoma benefit from immediate resection of clinically outlet lymph node matastasis, J Urol 2005, 173:816-819
- [9]. Marqulis, A1 Saqolowsky: Penile cancer: management of vejinol lymphatic drainage, Urolelin North Arn 2010, 37:411-419.
- [10]. Slaton JW, Morgenstern N, Levy DA et al: Tumor stage, Vascular invasion and the percentage of poorly differentiated cancer: independent progrostaticators of inguinal lymph nodes metastases in penile squamous cell cancer. J Urol 2001; 165:1138-1142
- [11]. Ravi R: correlation between the extent of nodal involvement and survival following groin dissection for carcinoma of penis. Britt J. Urol 1993; 72:817-819.
- [12]. Catalona WJ: Modified inguinal lymphadenectomy for carcinoma of the penis with preservation of saphenous veins: technique and preliminary results J. Urol 1988, 140:306-310
- [13]. Kroon BK, Lout AP, Valdes olmous RA et al: Morbidity of dynamic sentinal node biopsy in penile carcinoma. J. Urol 2005, 173:813-815.
- [14]. Tobias - Machado M, Absandro T, Moliva Jr WR et al: video endoscopic inguinal lymphadenectomy (VEIL): Minimally invasive Resection of inguinal lymph nodes. Int Braz J. Urol 2006:32:316-321