

Patterns of inguinal groin metastases in squamous cell carcinoma of the vulva

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Abstract

Objectives. Assess the pattern of groin node metastases in squamous cell carcinoma (SCC) of the vulva in relation to the site of the primary lesion. Assess whether the identified pattern of lymphatic spread supports the current surgical practice of assessing contralateral nodes for lateral lesions with ipsilateral nodal involvement.

Methods. A retrospective study of surgically staged patients with primary SCC of the vulva between 1955 and 1990 was conducted. This cohort of patients was divided in 4 subgroups by location of primary lesion: unilateral, bilateral, midline, and patients with mediolateral lesions. All clinical and pathological data were reviewed and updated to the 1988 TNM vulvar classification.

Results. 320 patients met the inclusion criteria, and almost all of them (>95%) underwent bilateral groin assessment. Of the 108 patients with positive groin lymph-node (LN) involvement, 77 presented with unilateral and 24 with bilateral inguofemoral involvement. Of the 163 patients presenting with only unilateral vulvar lesions, 48 had inguofemoral node involvement: 37 with ipsilateral-only nodal metastases, 8 with bilateral LN invasion, and only 3 (1.8%) had isolated contralateral nodal metastases. None of these patients with unilateral vulvar lesion that was either ≤ 2 cm in biggest diameter or with invasion ≤ 5 mm had bilateral groin LN involvement at diagnosis.

Conclusions. Ipsilateral lymphadenectomy is suitable for patients with unilateral lesions, distant from the midline, and either negative ipsilateral nodes, or with positive ipsilateral LN with lesions smaller than 2 cm.

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Introduction

Radical resection of the vulva in conjunction with resection of the inguofemoral (groin) nodes has been the standard surgical therapy for cancer of the vulva since the 1930s [1,2]. Consequent to superficial and deep groin dissection, patients may experience wound separation, infection, and prolonged healing. Late complications may include lymphedema with vulnerability to recurring episodes of lymphangitis or cellulitis as well as leg swelling sufficiently severe to restrict ambulation and other activities [3,4]. The objectives of care for the patient afflicted with vulvar cancer are to maximize the patient's

chances for permanent cancer control and to minimize functional and cosmetic damage after cancer eradication. Also, the knowledge that vulvar cancer recurrent in an undissected groin usually heralds a fatal outcome plays an important role in determining which is the most suitable procedure [5–11]. The risks of radical surgery must be balanced against the benefits of long-term survival, including loco-regional recurrences [12]. For that reason, there has been an obvious trend towards conservative surgery to reduce post-operative morbidity following vulvar surgery, including hemivulvectomy, separate groin incisions, unilateral groin dissections, dissection of only the superficial inguinal/femoral nodes, and investigation of sentinel node excision.

With tumors less than 2 cm in greater diameter and less than 1 mm of invasion, measured from the most superficial dermal

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papilla adjacent to the tumor or from the basement membrane (Stage 1A), the majority of authors would agree that a wide local excision with adequate margins is the most appropriate management for local control. Lymph node dissection is recommended when lesions are bigger than 2 cm or invasion is deeper than 1 mm, because the incidence of node metastasis in such cases has been reported to be as high as 32% [12–15].

While somewhat controversial, we believe that both the superficial and the deep inguinal nodes should be removed, as dissection of the superficial nodes alone carries a higher rate of recurrence, even for primary lesions less than 2 cm in diameter [11,12]. It is also accepted that when tumors are distant from the midline it would appear to be safe to perform a unilateral lymphadenectomy [11]. Little direct evidence is available about the status of the contralateral groin when ipsilateral nodes are not involved, although some studies indicate that the risk of contralateral nodal metastases in this situation approaches zero [7,10,16–18]. It is common practice to recommend contralateral lymphadenectomy in cases of ipsilateral positive nodes, because of the risk of contralateral metastasis and the recognition of the mortality associated with nodal metastases [5–10,12]. However, much of the historic data dealt with the incidence of contralateral nodal involvement in advanced cases with larger, or clinically involved ipsilateral nodes: less data are available on the risk of contralateral metastases in cases with microscopically positive disease.

We undertook this retrospective review to define the pattern of groin node involvement in squamous cell carcinoma (SCC) of the vulva. We specifically sought to identify the risk factors for contralateral groin metastases in lateralized primary lesions and whether the current practice of contralateral inguinal lymphadenectomy is supported in cases with positive ipsilateral nodes.

Methods

We conducted a retrospective study of patients with primary SCC of the vulva treated at Mayo Clinic between 1955 and 1990. Institutional Review Board approval was obtained for all studies performed. Data were retrieved from the patients' records, the institutional tumor registry, and death certificates. A single pathologist (T.A.G.) retrospectively reviewed all histology slides. All pathologic data, including size of lesion, depth of invasion, histologic involvement of the vagina, urethra, and rectum, and histologic assessment of inguinal and pelvic lymph nodes, were reviewed for all patients to update tumor staging using the 1994 International Federation of Gynecology and Obstetrics (FIGO) classification for SCC of the vulva [19]. All clinical data, including size of lesion, areas of involvement, and node status, were reviewed to update the patients' clinical stage of disease on the basis of the 1988 TNM classification for SCC of the vulva [20]. The information from the exact primary location was retrieved from the initial physical exam, documented in the chart, as well from the surgical report and pathological report. Different specific vulvar locations of the lesions, as well as size (in 3 planes), depth of invasion, side, total number of lesions, and involvement of adjacent structures were recorded. Also exact information from dissected LN was recorded: number of positive nodes, location (inguinofemoral or groin, pelvic, aortic), and side.

The technique of inguinofemoral node dissection used in our institution was designed to remove both superficial and deep inguinofemoral nodes and is described as follows. The inguinofemoral lymphadenectomy is carried out by dissecting all lymph node bearing tissue encompassed by the Sartorius muscle laterally, the adductor muscle medially, and the abdominal wall fascia superiorly, roughly 4 cm superior and parallel to the inguinal ligament. The dissection is carried out in the following manner: the fascia over the Sartorius muscle is

incised and the incision carried down to the apex of Scarpa's triangle. A similar incision is made over the adductor muscle, and the tissues beneath the two incisions are undermined creating access to the undersurface of the fascia overlying the area which is mobilized in a superior and medial fashion. This maneuver exposes the femoral artery. The femoral artery and vein are skeletonized, starting laterally with the artery in a cephalad fashion and proceeding to identification of the superficial external pudendal artery. This artery is ligated, facilitating identification of the sapheno-femoral junction. The femoral vein is skeletonized and the sapheno-femoral junction ligated following mobilization of all fatty and lymphatic tissue from the apex of the triangle to its base at the inguinal ligament. This tissue is transected along the inguinal ligament and submitted for evaluation en-bloc [15].

For the purpose of the study, we only considered patients with complete surgical staging for SCC of the vulva and information of the exact location of the primary vulvar lesion. Surgical staging was defined as vulvar radical treatment of the primary lesion with either bilateral groin lymphadenectomy or only ipsilateral inguinofemoral lymphadenectomy when these nodes were negatives. The rest of the patients were not considered further. Follow-up information was available for all the study subjects.

This cohort of patients was divided in 4 subgroups for analysis: patients with unilateral vulvar lesions, patients with bilateral lesions, patients with midline lesions, and patients with mediolateral lesions. Unilateral lesions were defined as lesions only affecting one side of the vulva, and at least 1 cm away from midline structures [21]. Lesions closer than 1 cm to the midline structures of the vulva were considered to involve the midline. If the primary tumor was located at the midline we defined them as midline lesions. Mediolateral lesions were defined when the primary tumor was located laterally but there was any type of midline involvement. Bilateral lesions affected both sides of the vulva with or without midline involvement. Determination and definition of patient outcomes, including sites and times of treatment failures (recurrences, reoccurrences, and metastases) are reported in previous publications [12].

Comparisons between pathological (depth on invasion, greatest diameter of primary lesion, number of positive inguinal lymph nodes) and clinical characteristics (clinical N stage) of tumors from patients presenting with unilateral lesions were evaluated by the Pearson Chi-square test and by logistic regression models. These models were constructed to investigate the independent variables associated with bilateral groin involvement. Variables first were assessed for their significance in a univariate logistic regression model. All significant variables were then examined in a multivariate logistic regression model, and the final model was generated by using a backwards elimination variable-selection method. Similar comparisons between these variables were performed in patients presenting with groin LN involvement to investigate the independent variables associated with pelvic LN metastasis. Ninety-five percent exact confidence interval was used to assess the likelihood of having a positive LN with a negative pathological node assessment of the specimen. All calculated *P* values were two-sided and *P* values less than 0.05 were considered statistically significant.

Results

During the study period, 444 patients with primary SCC of the vulva were treated at the Mayo Clinic. There were 320 patients that met the inclusion criteria. More than 95% percent of the patients included in this study underwent bilateral inguinofemoral lymphadenectomy which is a reflection of the eras encompassed by the study interval. Of these patients, 108 patients presented with pathologically documented groin LN involvement at the time of surgery: 77 with unilateral groin involvement, 24 with bilateral, and 7 with only contralateral groin involvement; 212 patients presented with no inguinofemoral LN involvement at the time of surgery (Table 1).

The study cohort of 320 patients was divided in 4 subgroups based on the anatomic location of the primary lesion (defined in

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