Anatomy & Staging of Vulva Cancers: All You Need to Know

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Vulva cancer accounts for 3-5% of all gynecologic malignancies and has an incidence of 2-2.5 per 100,000.00 women per year. The disease shows a bimodal age distribution. The most common histologic type is squamous cell carcinoma. Vulva cancer may directly invade adjacent structures or spread to inguinal and femoral lymph nodes. Early stage vulva cancer is treated by partial vulvectomy, with either ipsilateral or bilateral inguino-femoral lymph node dissection. Surgery is the treatment of choice even for locally advanced cancer, although neoadjuvant radiation and chemotherapy may be used either to enable surgery in cases deemed ‘inoperable’ at initial presentation or to avoid exenteration in what is frequently an elderly population. The most important prognostic factors in vulva cancer are tumor size, depth of invasion and the presence of lymph node metastases. In addition, surgical margin distance is an important predictor of local recurrence. A tumor-free pathologic margin of < 8 mm is associated with local recurrence of 23-50%. As the margin distance is a potentially modifiable factor, accurate preoperative evaluation of the primary tumor is important. The accurate detection and treatment of lymph node metastases in vulva cancer is critical and relapse in the lymph node basin is associated with an extremely poor survival. Clinical examination is of limited use in the detection of abnormal inguinal lymph nodes, with a sensitivity of 57% and specificity of 62%. For tumours with a depth of invasion of >1mm, surgical management will therefore typically include formal inguino-femoral node dissection on one or both sides. Although outcomes are excellent in early stage disease lymphadenectomy is associated with considerable morbidity including wound infection, breakdown, lymphocyst formation and long-term lymphoedema.

Accurate assessment of the extent of vulva disease and the detection of lymph node metastases are essential in planning the treatment of women affected by vulva cancer. In contrast to other imaging modalities such as CT or ultrasound, MRI has the potential to demonstrate both the extent of the vulva lesion and assess the groin lymph nodes simultaneously, thereby enabling the surgical team to tailor the extent of the procedure to the individual patient, hence reducing surgical morbidity. Patients are imaged in the supine position using a pelvic surface array multi-channel coil. The MRI protocol includes axial T1-weighted spin-echo images, sagittal T2-weighted fast recovery fast spin-echo (FRFSE) images, axial and coronal T2-weighted fat-suppressed FRFSE images and axial T1-weighted fat-suppressed spin-echo images acquired before and 70 seconds after the injection of intravenous gadolinium. The use of fat suppression on T2-weighted and CE-MRI images leads to a higher tumor detection rate.

T1-weighted fat-suppressed spin-echo images acquired before and 70 seconds after the injection of intravenous gadolinium. The use of fat suppression on T2-weighted and CE-MRI images leads to a higher tumor detection rate.

The perineal region is rich in fat, and tumors showing intermediate-high signal on T2-weighted images are difficult to recognize without the use of fat suppression. Although small vulva cancers can typically be evaluated clinically in the outpatient department, assessment may be hindered by pain and body habitus. Whilst it is unlikely that improved diagnostic accuracy of such smaller lesions is not anticipated to translate to a significant clinical benefit, the ability of preoperative imaging to accurately detect local extension to perineal structures would have significant prognostic, if not clinical impact, as reflected by recent proposals for the change in the FIGO staging classification.

A few studies have used MRI to evaluate lymph node metastasis in vulvar cancer. They report widely varying sensitivity and specificity ranging from 40% to 93% and 81% to 100%, respectively. Lymph node status in vulva cancer is of crucial prognostic importance and will dictate the extent of surgery in the lymphatic basin and the need for adjuvant chemo-radiation. The most commonly-used MRI criterion for groin lymph node metastasis is the short axis diameter of the node. However the reported sensitivity of this criterion is low, ranging from 40% to 50%. Other criteria, including S/L ratio, contour, signal intensity, and their combination, have been examined in order to improve sensitivity and accuracy. Our own study demonstrated that S/L ratio was a good quantitative marker for diagnosing lymph node metastasis with sensitivity, specificity and accuracy of 87%, 81% and 85% respectively. We examined other qualitative characteristics including those suggested by other studies, but no single criterion was as good as the overall diagnostic score, perhaps suggesting that experienced genitourinary radiologists make their diagnosis based on a combination of several MR features. The desire to reduce surgical morbidity for early stage disease has been the driving factor behind the evolution of sentinel node dissection (SLND) in vulva cancer. The risk of false negative results secondary to lymphatic stasis has lead many authorities to recommend the use of cross-sectional imaging such as MRI in the selection of cases for SLND. Identifying metastatic disease on preoperative MRI might reduce the risk of false negative results associated the use of SLND in obese patients. Information from preoperative MRI, perhaps coupled with image guided fine needle aspiration might avoid an unnecessary sentinel procedure and reduce the risk of requiring further surgery to the groins where lymph node metastasis is identified on routine pathological assessment after a false negative intraoperative frozen section.

References