

Journal für  
**Urologie und Urogynäkologie**

Zeitschrift für Urologie und Urogynäkologie in Klinik und Praxis

**Lymph Node Management in Penis**

**Cancer**

Clarke NW

*Journal für Urologie und*

*Urogynäkologie 2010; 17 (Sonderheft*

*6) (Ausgabe für Österreich), 10-11*

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# Lymph Node Management in Penis Cancer

N. W. Clarke

Squamous cell carcinoma of the penis affects approximately 1 per 100.000 male population per annum [1]. In those patients with disease stage greater than T1G2 the incidence of inguinal lymph node metastases is up to 70 % [2]. Because of this fact, patients with non-palpable inguinal nodes will often undergo prophylactic dissection, with expectation that this will improve survival [3]. However, the morbidity of inguinal node dissection is high and complication rates can exceed 40 % [4]. Management therefore needs to be tailored to individual patients, particularly where there is comorbidity and advanced age, and steps need to be taken to avoid unnecessary procedures where that is possible.

Presurgical assessment is fundamental to good practice in this disease. Regardless of the treatment modality of the primary lesion all patients should undergo lymph node management.

## ■ Non-palpable Nodes

In intermediate- and high-risk disease it is appropriate to undertake prophylactic inguinal node dissection. Ultrasound scan (with fine needle aspiration) and dynamic sentinel node biopsy and/or imaging should be considered in all such patients.

There are 3 risk groups for nodal disease:

**Low-risk** (Tis, TaG1-2 and T1G1), where nodes are affected in < 10 %. In these cases surveillance should be undertaken.

**Intermediate-risk** (T1G2) nodes are affected in up to 25 % but the risk is greater in cases of lymphatic and vascular invasion and where there is an infiltrative growth patterns. Dynamic sentinel node biopsy should also be considered with early modified lymph node dissection in positive cases. In negative cases surveillance should be initiated.

**High-risk** ( $\geq$  T1G3) nodes are involved in up to 40 % with G3 and with  $\geq$  T2 dis-

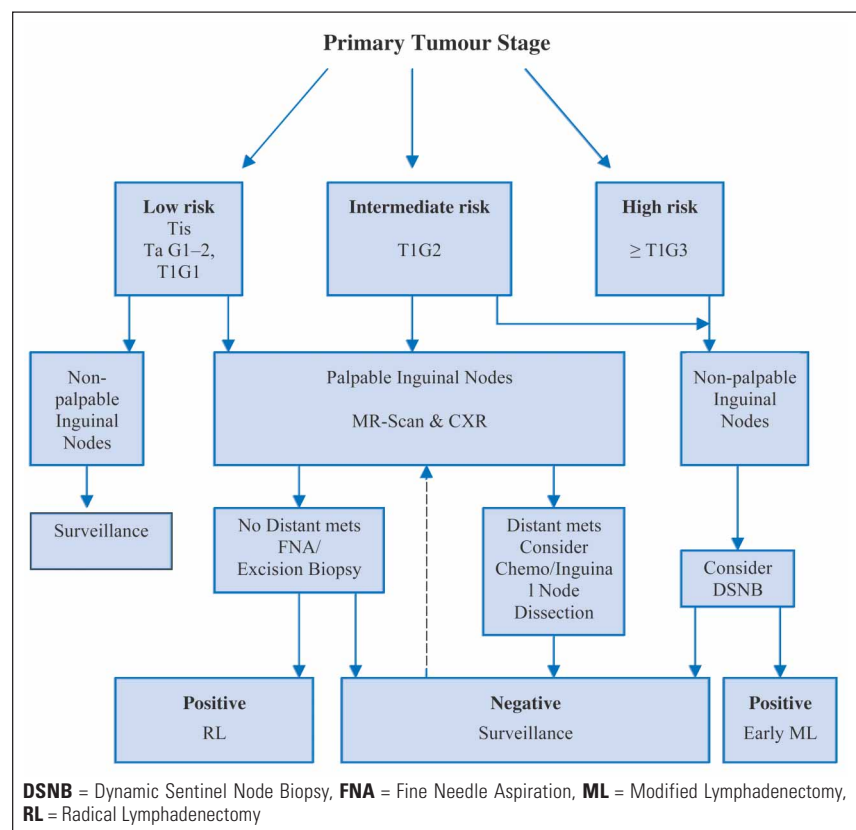
ease – this is 68 % or more. In these cases dynamic sentinel node biopsy should be considered with early modified lymphadenectomy in positive cases. Ultrasound scan and fine needle aspiration has a role to play in this group of patients and should be considered.

Recent evidence has become available suggesting that dynamic sentinel node biopsy (DSNB) can reduce the need for formal inguinal node dissection in > 70 % of patients [5], in addition to decreasing the morbidity to < 10 % [6]. Therefore dynamic sentinel node biopsy has the potential to reduce patient's hospitalisation, decrease the need for major surgery and minimise patient morbidity.

A sentinel node is one which drains fluid from a specific site of the body and is thought to be the first lymph node to

be involved with cancer when cancer spreads to local lymphatics (the „first order lymphatics“). Removing the sentinel node will allow testing for the presence of occult cancer cells. If the node contains cancer then there is a significant chance that other lymph nodes in that area are involved and they can be removed. However, if the sentinel node is uninvolved then there is a high chance that there has been no spread to the first order lymph nodes and the patient can be observed safely without recourse to major surgery.

Dynamic sentinel node biopsy is a technique which uses radioisotopes to detect the site of sentinel nodes, which can then be removed with minimal surgical trauma for pathological analysis. DSNB of the inguinal nodes is used successfully in melanoma patients and is a well



**Figure 1:** Lymph Node Assessment and Treatment. Mod. after [Heyns CF, Fleshner N, Sangar V, et al. Management of the lymph nodes in penile cancer. Urology 2010; 76 (2 Suppl 1): S43–S57].

established technique [7]. The technique used in Manchester is as follows:

The penis is injected intra-dermally with 40 MBq of 0.3 ml Tc99m nanocolloid 10–80 nm (0.1 ml injections) in the area around the tumour or previous tumour site (at 10, 2, 6 o'clock positions). A gamma-camera is then used to acquire pelvic images for analysis to provide anatomical details. These images show the location of the sentinel node. After 2 hrs the sentinel node is marked on the skin with a marker pen.

The following day surgery is undertaken under GA. 1 ml of blue dye (2.5 %) is injected around the tumour site at anaesthetic induction. Using a gamma probe (Neoprobe 2000) over the marked area on each inguinal area, the site of maximum activity is detected and a 2–3 cm incision is made over it. The sentinel node is the most radioactive node (or nodes) and it has usually assimilated the blue dye. This is removed and sent for pathological analysis.

### ■ Palpable Nodes

Size, position, number, fixation, relationship and oedema should be noted. In this scenario histological examination using FNA can be used. In cases where this is negative it can be repeated or excision biopsy can be undertaken. In appropriate cases where there are palpable nodes with negative histology/cytology, these can be re-assessed 4–6 weeks after surgery. In some circumstances lymph-

adenectomy may be done at the same time of surgery for the primary lesion. Patients with palpable nodes should undergo MR-scan of the abdomen and pelvis in addition to a CXR to assess for distant mets. In patients with bone pain a bone scan is indicated.

Where the FNA or histology from excision biopsy is positive a radical lymphadenectomy should be undertaken. Contra-lateral inguinal regions with no palpable nodes should be treated with either radical or modified lymphadenectomy as the incidence of contra-lateral disease is approximately 40 %. If excision biopsy is negative a program of surveillance can be initiated.

If > 2 nodes are found to be positive or there is extra capsular disease then the risk of pelvic nodal disease is up to 30 %. In this group 5-year-survival is markedly diminished. Preoperative pelvic/abdominal MR scan should be considered. In cases where no nodes are identified, pelvic lymphadenectomy is undertaken by some groups, although this is controversial. The role of adjuvant treatment with chemo- or radiotherapy in this setting is undetermined and further studies are required in this area.

In cases where there are large node masses, palliative surgery is indicated where this is possible. Pre-operative planning is essential and a key to this is cross sectional imaging to determine the relationship of the tumour with the underlying

vessels in the femoral triangle. Flap cover using scrotal skin, rotational skin flaps or vertical rectus abdominis flaps are often required to cover the skin defect arising as a consequence of this type of surgery. In cases where surgery is not possible, chemotherapy and radiotherapy, either alone or in combination are usually used. However, many of these cases will progress even with maximal treatment.

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