

Original article

Reliability of dynamic sentinel node biopsy combined with ultrasound-guided removal of sonographically suspicious lymph nodes as a diagnostic approach in patients with penile cancer with palpable inguinal lymph nodes

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Abstract

Introduction and objectives: Dynamic sentinel node biopsy (DSNB) is considered “unsuitable” in patients with penile cancer and palpable inguinal lymph nodes. The aim of this study was to determine the diagnostic reliability of DSNB combined with ultrasound (US)-guided removal of additional suspicious lymph nodes as a minimally invasive diagnostic approach in these patients.

Material and methods: A total of 23 consecutive patients with penile cancer and unilaterally or bilaterally palpable inguinal lymph nodes underwent DSNB according to the 2-day protocol. Before the combined staging procedure, the patients underwent preoperative US of both groins. During surgery, sentinel nodes and additional suspicious lymph nodes as determined by the US examination were removed under US guidance. A complete inguinal lymph node dissection was only performed in patients who had tumor-positive nodes. Follow-up consisted of control visits according to the European Association of Urology guidelines, including US investigation of the groins.

Results: The primary tumors were staged as T1, T2, and T3 carcinomas in 12, 8, and 3 patients, respectively. Grading was good, moderate, and poor in 2, 16, and 4 cases, respectively. Tumor grading could not be determined in 1 patient who underwent surgery of the invasive part of the primary tumor elsewhere. Sentinel nodes or nonsentinel nodes or both were positive in 15 of 36 palpable-positive groins. DSNB alone showed lymphatic spread in 10 inguinal regions. US-guided removal of suspicious nonsentinel nodes revealed 5 further inguinal basins with metastases, which would have been missed by DSNB owing to rerouting or complete blockage of the lymphotropic tracer. So far, no lymph node relapse has been observed in the 12 patients with node-negative disease by this combined diagnostic approach with a median follow-up of 42 (16–84) months. The morbidity (postoperative bleeding and prolonged lymphorrhea) associated with this procedure was minor (6%).

Conclusions: The results of this study imply that DSNB combined with US-guided removal of suspicious lymph nodes is a reliable diagnostic approach in patients with penile cancer with palpable inguinal lymph nodes. DSNB alone in these patients leads to a significant false-negative rate. These early and promising results have to be confirmed in larger cohort studies. © 2015 Elsevier Inc. All rights reserved.

Keywords: Penile cancer; Lymph node staging; Dynamic sentinel node biopsy; Ultrasound examination

1. Introduction

Accurate diagnosis of the presence or absence of lymphatic spread is still a crucial dilemma in the treatment

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of patients with penile cancer. Patients have a significant survival benefit from early removal of occult lymph node metastases compared with later lymph node dissection when lymph node metastases are clinically evident [1,2].

In patients with nonpalpable inguinal lymph nodes, the estimated risk of lymphatic metastatic disease is approximately 25%. In these patients, dynamic sentinel node biopsy (DSNB) has been proven an evidence-based, efficient staging procedure [3]. Patients with palpable inguinal lymph nodes are considered at a high risk of harboring lymph node metastases [3]. Recent studies showed lymphatic involvement in approximately 50% of patients with penile cancer with palpable lymph nodes [4,5]. In these patients, DSNB is not recommended [3], mainly owing to a possible alteration of the lymphatic drainage by a phenomenon called “tumor blockage.” Here, the obstruction of the lymph flow, and consequently the flow of the applied lymphotropic tracer by a significant amount of tumor cells, leads to a failure of sentinel node identification or rerouting of the tracer to a so-called “neo-sentinel” node, which does not show tumor involvement at the time of removal, yet

leading to a false-negative result for DSNB [6,7] (Fig.). Inguinal lymph node dissection overcomes this limitation of DSNB, but still approximately 50% of the patients with palpable lymph nodes are faced with unnecessary morbidity owing to this procedure.

The aim of this study was to prospectively evaluate the reliability and morbidity of a combined radio- and ultrasound (US)-guided approach of removing sentinel and ultrasonographically suspicious lymph nodes in staging of patients with penile cancer with palpable inguinal lymph nodes.

2. Material and methods

Patients with a histologically proven or clinically evident invasive penile carcinoma underwent sentinel node biopsy according to the 2-day protocol [8,9] owing to unilaterally or bilaterally palpable inguinal lymph nodes at the time of surgical treatment of the penile lesion. A day before the surgery, US examination of the groins was performed, and

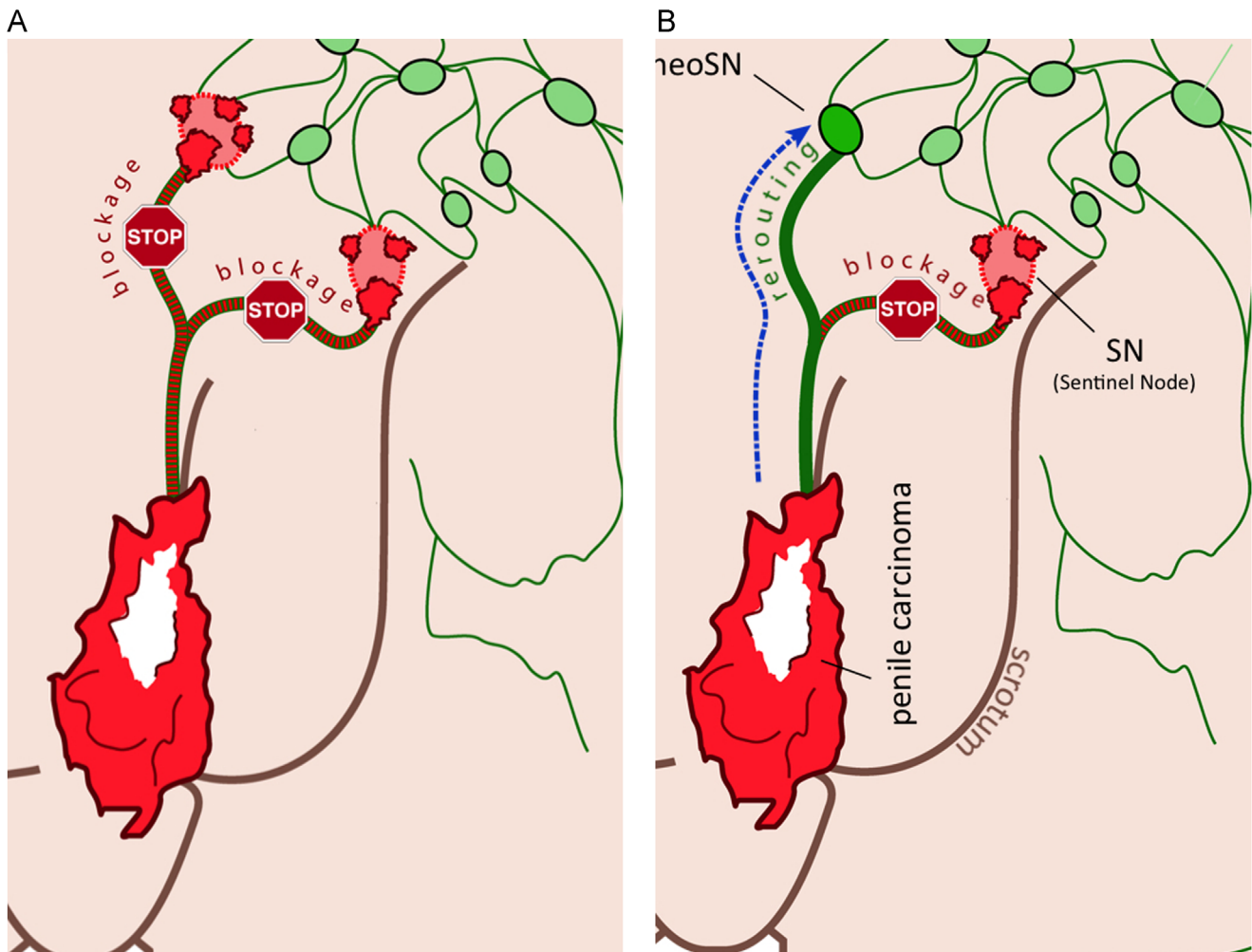


Fig. Significant amount of tumor cells within original sentinel lymph node(s) leads to “complete blockage” of tracer flow (A) or “rerouting” (B) to a so-called “neo-sentinel node.”

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