



## **Penile cancer**

Diagnosis, prognosis, and treatment

av

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### **Akademisk avhandling**

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## Abstract

The aim of this thesis is to optimise the clinical management and prognostic evaluation of penile cancer (PeCa) by investigating its long-term consequences and treatment-related morbidity, as well as by evaluating current surgical strategies and novel biomarker-based approaches for accurate lymph node staging.

In **Paper I**, nationwide register data demonstrated that patients with PeCa face a two- to threefold increased risk of developing second HPV-associated malignancies in the oral cavity, oropharynx, and anal canal, highlighting the need for improved surveillance and preventive measures. In **Paper II**, population-based analyses demonstrated that morbidity following lymph node dissection remains substantial over time, with significantly elevated risks of infectious complications persisting for more than five years and thromboembolic events for up to three years postoperatively, underscoring the importance of long-term complication awareness. In **Paper III**, an evaluation of a panel of 14 soluble immune checkpoint proteins (sICs) for predicting lymph node metastases (LNM) revealed limited clinical utility due to low sensitivity and modest accuracy. However, four inhibitory sICs (IDO, TIM-3, CD80, and CTLA-4) were significantly elevated in patients with PeCa compared to cancer-free controls, suggesting tumour-induced systemic immunosuppression. In **Paper IV**, dynamic sentinel node biopsy (DSNB) was shown to effectively detect LNM while maintaining favourable morbidity, although a false-negative rate of 14.5% was observed during a median follow-up of 34 months. Complications, predominantly mild to moderate, occurred in 14.8% of groins and were directly associated with higher lymph node yields, emphasizing the critical importance of precise and targeted excision of true sentinel nodes.

Keywords: biomarkers, complications, dynamic sentinel node biopsy, human papillomavirus, immune checkpoint proteins, inguinal lymph node dissection, penile cancer, prognostic factors