O6

# Hybrid ICG-99mTc-nanocolloid, on the road towards becoming the new standard for sentinel node biopsy in penile cancer?

European Urology Open Science 2020;21(Suppl 3):S94

De Vries H-M.[1], Dell'oglio P.[2], Mazzone E.[3], Kleinjan G.H.[4], Donswijk M.L.[5], Van Der Poel H.G.[1], Horenblas S.[1], Van Leeuwen F.W.B.[4], Brouwer O.R.[1]

[1]NKI-AVL, Dept. of Urology, Amsterdam, The Netherlands, [2]ASST Grande Ospedale Metropolitano Niguarda, Dept. of Urology, Milan, Italy, [3]IRCCS Ospedale San Raffaele, Scientific Institute, Dept. of Urology, Dept. of Experimental Oncology, Milan, Italy, [4]Leiden University Medical Center, Dept. of Interventional Molecular Imaging Laboratory, Dept. of Radiology, Leiden, The Netherlands, [5]NKI-AVL, Dept. of Nuclear Medicine, Amsterdam, The Netherlands

**Introduction & Objectives:** Sentinel node (SN) biopsy in penile cancer (PeCa) is typically performed using $^{99m}$Tc-nanocolloid and blue dye. Recent reports suggest that the hybrid tracer indocyanine green (ICG)-$^{99m}$Tc-nanocolloid may improve intraoperative SN identification through combined radioactive and fluorescence guidance. However, further investigation will be required before this technique could be widely adopted for treatment of PeCa. The aims of the current study were to confirm the reliability of the use of ICG-$^{99m}$Tc-nanocolloid and to investigate the added value of intraoperative fluorescence imaging over visual detection of blue dye in the largest series of PeCa SN biopsies with ICG- $^{99m}$Tc-nanocolloid to date.

**Materials & Methods:** 400 ³T1G2N0 PeCa patients scheduled for SN biopsy and treatment of the primary tumour at a single European centre were included in this study. SNs were preoperatively identified based on lymphoscintigraphy and SPECT/CT after peritumoural injection of ICG-$^{99m}$Tc-nanocolloid. Blue dye was administered intraoperatively in 266 patients . During surgery, SNs were pursued via gamma tracing, visual identification (blue dye) and near-infrared fluorescence imaging. Intraoperative SN identification rates using radio- and fluorescence guidance were individually assessed in all patients. In those patients who received ICG-$^{99m}$Tc-nanocolloid and blue dye, fluorescence SN identification rates were compared with blue dye using a chi-square test.

**Results:** 740 groins were assessed and no tracer-related adverse events were reported. All preoperatively defined SNs (n=1163) were intraoperatively localized. 98% of all excised SNs could be detected using gamma tracing and in 96% with fluorescence imaging. 95 SN tumour-positive SNs were found, which all proved to contain both a radioactive and fluorescence signal. A comparison of the optical identification methods showed that fluorescence imaging yielded a 39.2% higher SN detection-rate relative to blue dye (95.3 vs. 56.1%). 100% of the SNs that were tumour-positive at pathology could be intraoperatively visualized by fluorescence imaging, whereas merely 84% were stained blue.

**Conclusions:** ICG-$^{99m}$Tc-nanocolloid was shown to be a reliable SN tracer for PeCa in a large patient cohort of 400 ³T1G2N0 PeCa patients. Fluorescence imaging was shown to significantly outperform optical SN detection based on blue dye.