

PEROPERATIVE ASSESSMENT OF TUMOR RESECTION MARGINS USING HIGH-RESOLUTION PET/CT IN ORAL CARCINOMA, A FEASIBILITY CLINICAL TRIAL.

Debacker J.¹, Marcinkowski R.², Keereman V.², D'Asseler Y.^{3,4}, Goethals I.^{3,4}, Creytens D.^{3,5}, Van Hoken R.², Huvenne W.^{1,6}

1 Department of Head and Skin, Ghent University, Ghent, Belgium

2 Molecubes NV, Ghent, Belgium

3 Department of Diagnostic Sciences, Ghent University, Ghent, Belgium

4 Department of Nuclear Medicine, Ghent University Hospital, Ghent, Belgium

5 Department of Anatomical pathology, Ghent University Hospital Ghent, Belgium

6 Department of Head and Neck Surgery, Ghent University Hospital Ghent, Belgium

BACKGROUND

Microscopically tumor-infiltrated margins and lymph nodes in the treatment of oral squamous cell carcinomas result in a significantly increased locoregional recurrence rate, associated with an important **reduction in overall survival**.¹ The current standard of practice for assessing the margin status is to perform frozen section analysis of samples taken from the resection cavity, but this is both time consuming and prone to sampling bias.

PROBLEM & PROPOSED SOLUTION

There is currently no ideal method for identifying the tumor margin status during surgery in a reliable and time efficient manner. Identifying tumor-infiltrated margins peroperatively would allow complete resection of the primary tumor if necessary. We propose using **per-operative high-resolution ¹⁸F-FDG PET/CT of the excised tumor specimen** to identify residual tumor-infiltrated margins and lymph nodes.²

PREVIOUS WORK

- Proof-of-concept study in breast conserving surgery
 - Sensitivity: 88%
 - Specificity: 80%

HIGH-RESOLUTION PET/CT

- Technical specifications
 - CT: spatial resolution of 50 μ m
 - PET: spatial resolution of 0.85 mm / sensitivity of 12%
 - System dimensions of 55 x 55 x 55 cm³
- Advantages
 - Small footprint
 - Sub-millimeter PET resolution
 - Short acquisition time

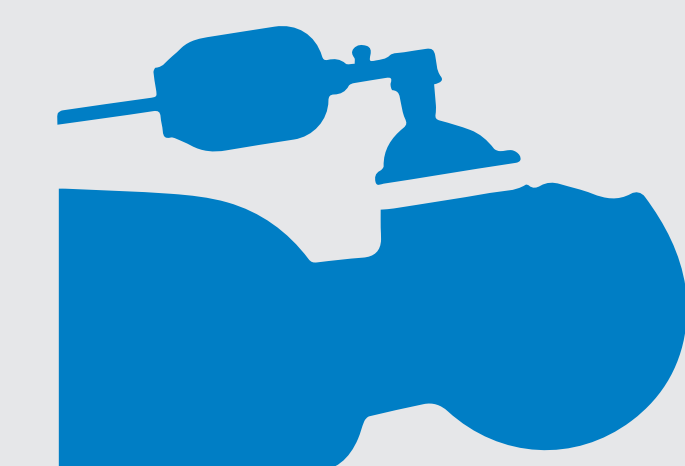
CONCLUSION

The proposed methodology for using micro-PET/CT specimen imaging is a promising technique for the intraoperative tumor margin assessment of head and neck squamous cell carcinomas of the oral cavity. The aim of the current study is to further evaluate the feasibility of high-resolution ¹⁸F-FDG-PET/CT for intraoperative margin assessment of resected squamous cell carcinomas of the head and neck region and compare the results to the gold standard.

PROPOSED METHODOLOGY

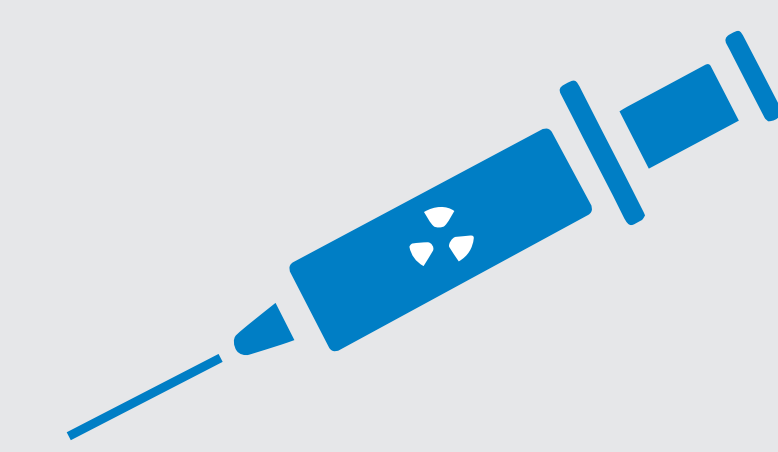
STEP 1: ANESTHESIA

General anesthesia will be administered as per local protocol.



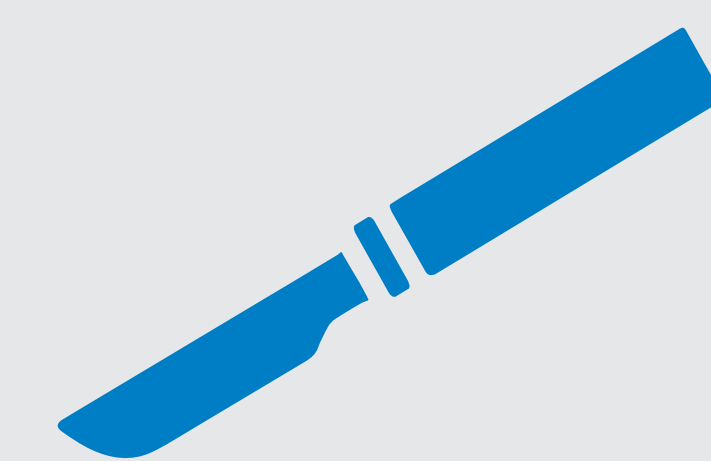
STEP 2: RADIONUCLIDE INJECTION

¹⁸F-FDG will be administered intravenously in the operating room.



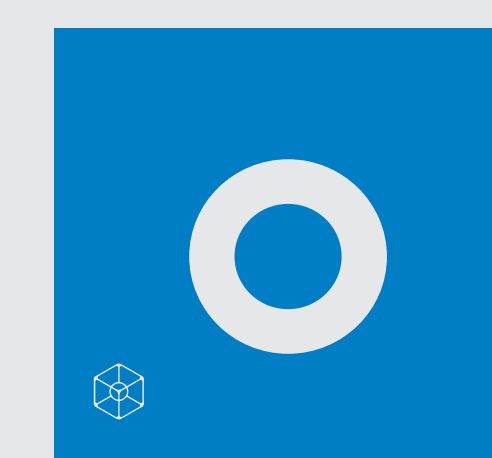
STEP 3: TUMOR RESECTION

Tumor excision and lymphadenectomy will start at least 45-60 minutes post-injection.



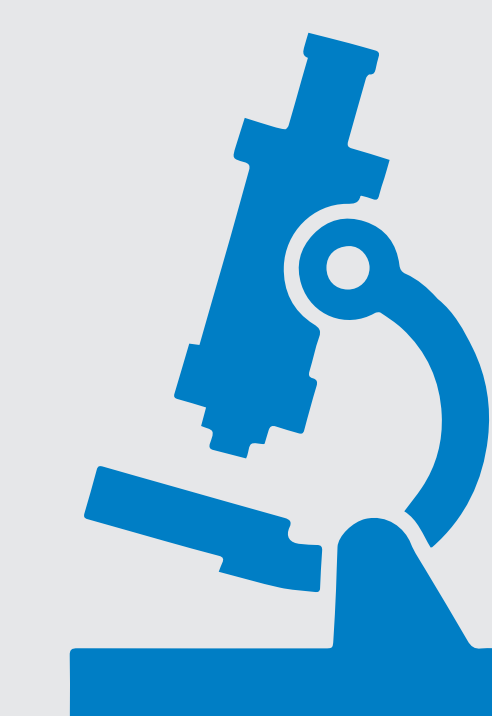
STEP 4: μ PET/CT

Both primary tumor and lymphadenectomy samples will be imaged using the high resolution PET/CT.



STEP 5: HISTOPATHOLOGY

Standard histopathological examination will be performed to obtain the gold standard result.



CONTACT jensm.debacker@ugent.be

 Universiteit Gent

 @ugent

 Ghent University