UNIVERSITY OF AMSTERDAM

UvA-DARE (Digital Academic Repository)

Optimization of nuclear medicine techniques to improve clinical management in solid cancers

Hellingman, D.

Publication date
2020

Document Version
Other version

License
Other

Link to publication

Citation for published version (APA):
Hellingman, D. (2020). *Optimization of nuclear medicine techniques to improve clinical management in solid cancers*. [Thesis, externally prepared, Universiteit van Amsterdam].

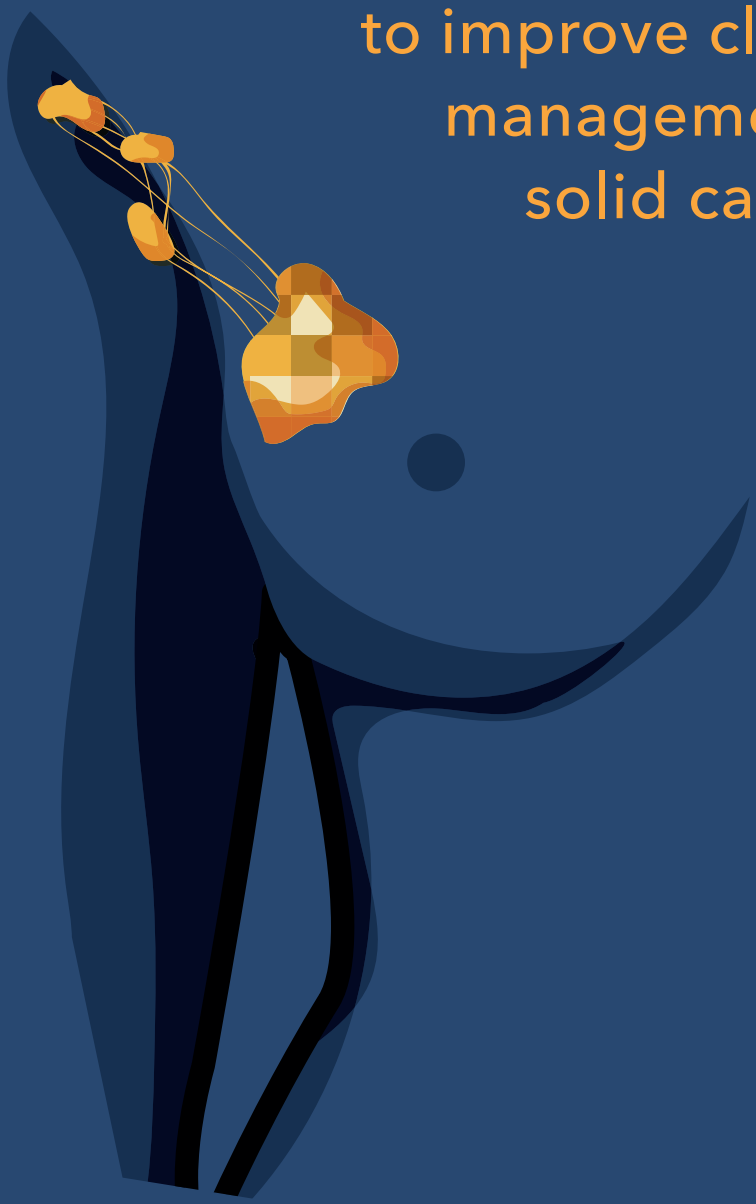
General rights
It is not permitted to download or to forward/distribute the text or part of it without the consent of the author(s) and/or copyright holder(s), other than for strictly personal, individual use, unless the work is under an open content license (like Creative Commons).

Disclaimer/Complaints regulations
If you believe that digital publication of certain material infringes any of your rights or (privacy) interests, please let the Library know, stating your reasons. In case of a legitimate complaint, the Library will make the material inaccessible and/or remove it from the website. Please Ask the Library: https://uba.uva.nl/en/contact, or a letter to: Library of the University of Amsterdam, Secretariat, P.O. Box 19185, 1000 GD Amsterdam, The Netherlands. You will be contacted as soon as possible.

UvA-DARE is a service provided by the library of the University of Amsterdam (https://dare.uva.nl)

Download date:07 Oct 2026

Optimization of nuclear medicine techniques to improve clinical management in solid cancers



Daan Hellingman

Optimization of nuclear medicine techniques to improve clinical management in solid cancers

Daan Hellingman

Layout and Design: proefschrift-aio.nl | Guus Gijben
Printed by: proefschrift-aio.nl
ISBN: 978-94-93184-42-8

The work described in this thesis was conducted at the Netherlands Cancer Institute – Antoni van Leeuwenhoek Hospital, Amsterdam, The Netherlands.
Part of this thesis was supported by a kind contribution from Mrs. Durlinger.
Printing of this thesis was supported by kind contributions from: Netherlands Cancer Institute – Antoni van Leeuwenhoek Hospital, 2Quart Medical BV, Pfizer.

© Daan Hellingman, Amsterdam 2020

All rights reserved. No part of this publication may be reproduced, stored, or transmitted in any form or by any means without the permission in writing of the copyright owners. Copyright of the published chapters is held by the journals in which the work appears.

Optimization of nuclear medicine techniques to improve clinical management in solid cancers

ACADEMISCH PROEFSCHRIFT

ter verkrijging van de graad van doctor
aan de Universiteit van Amsterdam
op gezag van de Rector Magnificus
prof. dr. ir. K.I.J. Maex
ten overstaan van een door het College voor Promoties ingestelde
commissie, in het openbaar te verdedigen
op woensdag 3 juni 2020, te 10.00 uur
door

Daan Hellingman
geboren te Purmerend

Promotiecommissie

Promotor:	prof. dr. E.J.T. Rutgers	AMC-UvA
Copromotores:	dr. M.P.M. Stokkel	NKI-AvL
	dr. B.J. de Wit-van der Veen	NKI-AvL
Overige leden:	prof. dr. R.J. Bennink	AMC-UvA
	dr. G. van Tienhoven	AMC-UvA
	prof. dr. P.J. Tanis	AMC-UvA
	prof. dr. R. Boellaard	Vrije Universiteit Amsterdam
	prof. dr. S.C. Linn	Universiteit Utrecht
	dr. W.V. Vogel	NKI-AvL

Faculteit der Geneeskunde

Contents

CHAPTER 1 9
Introduction and outline

Part 1: Improving lymphatic mapping in breast cancer

CHAPTER 2 25
Predictive risk factors for sentinel lymph node non-visualization on planar lymphoscintigraphy using an intratumoral injection in patients with primary breast cancer *Nucl Med Commun. 2019;40:317-324*

CHAPTER 3 45
The hidden sentinel node in breast cancer: reevaluating the role of SPECT/CT and tracer reinjection *Eur J Surg Oncol. 2016;42:497-503*

CHAPTER 4 63
Sentinel lymph node non-visualization after intratumoral radioisotope tracer injection in breast cancer is not associated with a higher nodal metastasis rate or worse outcomes *J Surg Oncol. 2019;119:421-429*

Part 2: Portable gamma camera imaging to improve the sentinel lymph node procedure

CHAPTER 5 85
The use of intraoperative small and large field of view gamma cameras for radioguided surgery *In: Radioguided Surgery. Switzerland: Springer International Publishing; 2016. p. 35–56*

CHAPTER 6 111
Detecting near-the-injection-site sentinel nodes in head and neck melanomas with a high-resolution portable gamma camera *Clin Nucl Med. 2015;40:e11-6*

CHAPTER 7 127
A new portable hybrid camera for fused optical and scintigraphic imaging: first clinical experiences *Clin Nucl Med. 2016;41:e39-43*

CHAPTER 8 139
Hybrid surgical guidance: Does hardware integration of gamma- and fluorescence- imaging modalities make sense? *J Nucl Med. 2017;58:646-650*

Part 3: Nuclear Medicine techniques to improve staging and characterization in breast cancer

CHAPTER 9 157
Feasibility of radioguided occult lesion localization of clip-marked lymph nodes for tailored axillary treatment in breast cancer patients treated with neoadjuvant systemic therapy *EJNMMI Res. 2019;9:94*

CHAPTER 10 175
A novel semi-robotized device for high-precision ^{18}F-FDG-guided breast cancer biopsy *Rev Esp Med Nucl Imagen Mol. 2017;36:158-165*

CHAPTER 11 191
Intratumoral heterogeneity on pretreatment ^{18}F-FDG PET/CT is not associated with pathologic complete response to neoadjuvant systemic treatment in stage II/III triple-negative and HER2-positive breast cancer *Submitted*

Part 4: Discussion and summary

CHAPTER 12 231
1. Discussion and future prospects 233
2. Summary 247
3. Samenvatting 253

ADDENDUM 259
Affiliations co-authors 260
PhD portfolio 262
Dankwoord 266
Curriculum vitae 272