

University of Groningen

A 21-Year-Old Patient With a HER2-Positive Colorectal Cancer

Bensch, Frederike; van Rooijen, Johan M.; Schröder, Carolien P.; Reyners, Anna K. L.

Published in:
Gastroenterology

DOI:
[10.1053/j.gastro.2014.09.046](https://doi.org/10.1053/j.gastro.2014.09.046)

IMPORTANT NOTE: You are advised to consult the publisher's version (publisher's PDF) if you wish to cite from it. Please check the document version below.

Document Version
Publisher's PDF, also known as Version of record

Publication date:
2015

[Link to publication in University of Groningen/UMCG research database](#)

Citation for published version (APA):

Bensch, F., van Rooijen, J. M., Schröder, C. P., & Reyners, A. K. L. (2015). A 21-Year-Old Patient With a HER2-Positive Colorectal Cancer. *Gastroenterology*, *148*(1), 20-21.
<https://doi.org/10.1053/j.gastro.2014.09.046>

Copyright

Other than for strictly personal use, 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), unless the work is under an open content license (like Creative Commons).

The publication may also be distributed here under the terms of Article 25fa of the Dutch Copyright Act, indicated by the "Taverne" license. More information can be found on the University of Groningen website: <https://www.rug.nl/library/open-access/self-archiving-pure/taverne-amendment>.

Take-down policy

If you believe that this document breaches copyright please contact us providing details, and we will remove access to the work immediately and investigate your claim.

Downloaded from the University of Groningen/UMCG research database (Pure): <http://www.rug.nl/research/portal>. For technical reasons the number of authors shown on this cover page is limited to 10 maximum.

A 21-Year-Old Patient With a HER2-Positive Colorectal Cancer



Frederike Bensch,¹ Johan M. van Rooijen,^{1,2} Carolien P. Schröder,¹ and Anna K. L. Reyners¹

¹Department of Medical Oncology, University of Groningen, University Medical Center Groningen; and ²Department of Internal Medicine, Martini Hospital, Groningen, The Netherlands



Scan the quick response (QR) code to the left with your mobile device to watch this article's video abstract and others. Don't have a QR code reader? Get one by searching 'QR Scanner' in your mobile device's app store.

Colorectal cancer (CRC) is one of the most common cancers diagnosed in men and women worldwide. In the 15- to 29-year-old age group CRC accounts for about 2% of all malignancies.^{1,2} Like in adults, presenting symptoms are anemia, abdominal pain, bleeding, weight loss, and change in bowel habits.² The clinical presentation and the primary work-up with (total) colonoscopy and a confirmatory biopsy determine further treatment and surveillance strategies.³ In case of suspected or proven metastatic disease, additional staging by means of laboratory assessments including tumor marker carcinoembryonic antigen (CEA), computed tomography (CT) or magnetic resonance imaging (MRI) and molecular testing (eg, RAS, BRAF) are recommended. Molecular imaging by positron emission tomography (PET) can be of value in case of potentially surgically curable disease, but also in case of a clinical dilemma with unknown/unclear primary origin of tumor and/or metastases and assessment of the receptor status.⁴

Description of Technology

Trastuzumab, a monoclonal antibody interfering with human epidermal growth factor receptor 2 (HER2), was conjugated and labeled with the radionuclide zirconium-89 (⁸⁹Zr).^{5,6} Four days before performing the PET scan the tracer ⁸⁹Zr-trastuzumab was administered intravenously to the patient. After imaging reconstruction, a maximum intensity projection (MIP) as volume rendering method for 3D data was used for visualization (Video 1 and Figure 1).

Video Description

Here we show the images of a 21-year-old female patient, who was referred to our hospital with a symptomatic, by colonoscopy, and histology confirmed cancer of

unknown primary origin with an apparent submucosal mass in the sigmoid colon, as well as cervical and supraclavicular lymph nodes. Histology of the submucosal mass revealed a low differentiated, strongly HER2-positive adenocarcinoma. On the ⁸⁹Zr-trastuzumab-PET scan, as an additional tool to solve this clinical dilemma, intense ⁸⁹Zr-trastuzumab uptake was seen in the mass in the lower pelvic cavity and in cervical, supraclavicular, paraesophageal, paraaortal and iliacal lymph nodes confirming the positive HER2 status of all tumor localizations seen on the FDG-PET (Video 1 and Figure 1A). There were no signs of primary breast, gastric or gynecological cancer, which was later confirmed by mammography, upper endoscopy and transvaginal ultrasound. As expected, in the circulation, in the liver, kidneys, oropharyngeal region, and intestine, ⁸⁹Zr-trastuzumab was enriched physiologically. Subsequently, the patient was treated with trastuzumab in combination with capecitabine and oxaliplatin (CAPOX-T), leading to a complete remission, already after 3 courses. After 6 courses of combination therapy no signs of residual disease could be seen on FDG- and also on ⁸⁹Zr-trastuzumab-PET (Figure 1B), and trastuzumab monotherapy was continued for another 9 months until disease progression.

Take Home Message

Obtaining up-to-date whole body information with information of not only the localization, but also molecular characteristics of the primary tumor and metastases within a patient might be of great value in a patient with a clinical dilemma. Furthermore, PET scan techniques are able to visualize certain molecular targets throughout the whole body, and may therefore - in a patient friendly way - provide comprehensive information on receptor status, which could

Abbreviations used in this paper: CAPOX-T, Capecitabine, oxaliplatin, trastuzumab; CEA, carcinoembryonic antigen; CRC, colorectal cancer; CT, computed tomography; HER2, human epidermal growth factor receptor 2; MIP, maximum intensity projection; MRI, magnetic resonance imaging; PET, positron emission tomography; ⁸⁹Zr, Zirconium-89.

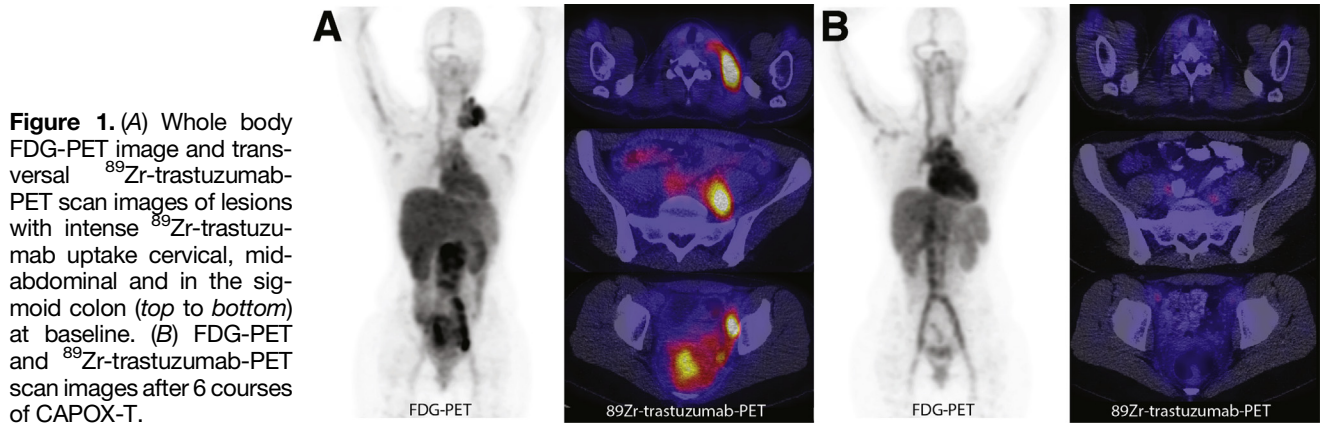


Figure 1. (A) Whole body FDG-PET image and transverse ^{89}Zr -trastuzumab-PET scan images of lesions with intense ^{89}Zr -trastuzumab uptake cervical, mid-abdominal and in the sigmoid colon (top to bottom) at baseline. (B) FDG-PET and ^{89}Zr -trastuzumab-PET scan images after 6 courses of CAPOX-T.

also help with the optimal selection of the right treatment for the right patient.

Supplementary Material

Note: To access the supplementary material accompanying this article, visit the online version of *Gastroenterology* at www.gastrojournal.org, and at <http://dx.doi.org/10.1053/j.gastro.2014.09.046>.

References

1. Gondos A, Hiripi E, Hollecsek B, et al. Survival among adolescents and young adults with cancer in Germany and the United States: an international comparison. *Int J Cancer* 2013;133:2207–2215.
2. Goldberg J, Furman WL. Management of colorectal carcinoma in children and young adults. *J Pediatr Hematol Oncol* 2012;34(Suppl 2):S76–S79.
3. National Comprehensive Cancer Network (NCCN). Clinical Practice Guideline in Oncology (NCCN Guidelines) Colon Cancer, Version 3.2014; 2014. Available at: [http://](http://www.nccn.org/professionals/physician_gls/pdf/colon.pdf)

www.nccn.org/professionals/physician_gls/pdf/colon.pdf. Accessed July 22, 2014.

4. Gaykema SB, Brouwers AH, Hovenga S, et al. Zirconium-89-trastuzumab positron emission tomography as a tool to solve a clinical dilemma in a patient with breast cancer. *J Clin Oncol* 2012;30:e74–e75.
5. Dijkers EC, Oude Munnink TH, Kosterink JG, et al. Biodistribution of ^{89}Zr -trastuzumab and PET imaging of HER2-positive lesions in patients with metastatic breast cancer. *Clin Pharmacol Ther* 2010;87:586–592.
6. Dijkers EC, Kosterink JG, Rademaker AP, et al. Development and characterization of clinical-grade ^{89}Zr -trastuzumab for HER2/neu immunoPET imaging. *J Nucl Med* 2009;50:974–981.

Reprint requests

Address requests for reprints to: Frederike Bensch, MD, Department of Medical Oncology, DA11, University of Groningen, University Medical Center Groningen, Hanzeplein 1, 9713 GZ Groningen, The Netherlands. e-mail: f.bensch@umcg.nl; fax: +31-50-3614862.

Conflicts of interest

The authors disclose no conflicts.