



ASO Author Reflections: The PlasmaJet[®] Device Contributes to an Increase in the Number of Complete Cytoreductive Surgeries for Ovarian Cancer Patients

G. M. Nieuwenhuyzen-de Boer, MD^{1,2}, and H. J. van Beekhuizen, MD, PhD¹

¹Department of Gynecologic Oncology, Erasmus MC Cancer Institute, University Medical Center, Rotterdam, The Netherlands; ²Department of Obstetrics and Gynecology, Albert Schweitzer Hospital, Dordrecht, The Netherlands

PAST

The most important independent prognostic factor for survival of patients with advanced-stage epithelial ovarian cancer (EOC) is the completeness of cytoreductive surgery.¹ Standard surgical treatment of advanced-stage ovarian carcinoma with electrosurgery cannot always result in complete cytoreductive surgery (CRS), especially when many small metastases are found on the mesentery and intestinal surfaces.

Available literature showed that the use of the PlasmaJet[®] device contributes to an increase in the number of complete cytoreductive surgeries for ovarian cancer patients.² A randomized controlled study (RCT) to demonstrate safety and effectiveness was lacking.³ For this reason, the authors investigated whether adjuvant use of a neutral argon plasma device helps to increase the complete cytoreduction rate without an increase in the number of complications.⁴

PRESENT

The PlaComOv Study on the effectiveness and safety of the PlasmaJet device during CRS shows that surgery with the adjuvant use of the PlasmaJet is associated with a significant higher percentage of complete CRS procedures for patients with resectable disease.⁵ This benefit was even

stronger in the subset analysis of patients with peritoneal carcinomatosis, defined as 50 or more metastatic lesions on the peritoneum, diaphragm, or mesentery.

In the intervention group, the PlasmaJet was used 104 times during surgery (75%). In 41% of the procedures, the gynecologic oncologists gave their opinion that the PlasmaJet was necessary (12%) or very useful (29%) to achieve complete CRS. The PlasmaJet simplifies the removal of lesions at locations of the diaphragm without muscle contractions, peritoneum, or superficial tumor lesions at vulnerable sites such as the mesentery and the colon.

The surgical complication rate did not differ significantly between the two groups. A relaparotomy was performed for eight patients in the intervention group. No relaparotomy was related to the use of the PlasmaJet.

FUTURE

Considering that the surgical outcome has an important impact on both progression-free survival (PFS) and overall survival (OS),¹ the authors recommend that clinicians consider using the PlasmaJet during CRS. Still, survival data need to mature for assessment of the effect on PFS and OS outcomes.

The patients in the intervention group reported more favorable health scores than the patients in the control group. A possible explanation could be the lower percentage of colostomies in the intervention group (9 vs 20) or the long-term protective effect of the PlasmaJet, resulting in less tissue damage. Research into the difference in quality of life is in progress.

The mean total health care costs for use of the PlasmaJet in CRS for ovarian cancer will be higher than for conventional CRS. A cost analysis of treatment with the

© The Author(s) 2022

First Received: 13 April 2022

Accepted: 14 April 2022

Published Online: 28 April 2022

G. M. Nieuwenhuyzen-de Boer, MD
e-mail: g.nieuwenhuyzen-deboer@erasmusmc.nl

adjuvant use of the PlasmaJet is under construction. A cost-effectiveness analysis can be performed once data about quality of life and survival are available.

ACKNOWLEDGEMENT The study was funded by the Netherlands Organization for Health Research and Development (ZonMw) (No. 843001805). PlasmaSurgical and Medical Dynamics provided an in-kind subsidy for the loan and maintenance of the PlasmaJet systems during this research.

DISCLOSURE There are no conflicts of interest.

OPEN ACCESS This article is licensed under a Creative Commons Attribution 4.0 International License, which permits use, sharing, adaptation, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons licence, and indicate if changes were made. The images or other third party material in this article are included in the article's Creative Commons licence, unless indicated otherwise in a credit line to the material. If material is not included in the article's Creative Commons licence and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder. To view a copy of this licence, visit <http://creativecommons.org/licenses/by/4.0/>.

REFERENCES

1. Delga B, Classe JM, Houvenaeghel G, et al. 30 years of experience in the management of stages III and IV epithelial ovarian cancer: impact of surgical strategies on survival. *Cancer Basel*. 2020;12:768.
2. Volcke A, Van Nieuwenhuysen E, Han S, Salihi R, Van Gorp T, Vergote I. Experience with PlasmaJet™ in debulking surgery in 87 patients with advanced-stage ovarian cancer. *J Surg Oncol*. 2021;123:1109–14.
3. Nieuwenhuyzen-De Boer GM, Van Der Kooy J, Van Beekhuizen HJ. Effectiveness and safety of the PlasmaJet® device in advanced-stage ovarian carcinoma: a systematic review. *J Ovarian Res*. 2019;12:71.
4. Nieuwenhuyzen-De Boer GM, Hofhuis W, Reesink-Peters N, et al. Evaluation of effectiveness of the PlasmaJet surgical device in the treatment of advanced stage ovarian cancer (PlaComOv Study): study protocol of a randomized controlled trial in the Netherlands. *BMC Cancer*. 2019;19:58.
5. Nieuwenhuyzen-de Boer GM, Hofhuis W, Reesink-Peters N, et al. The role of adjuvant use of the PlasmaJet® device during cytoreductive surgery for advanced-stage ovarian cancer: results of the PlaComOv-Study, a randomized, controlled trial in the Netherlands. *Ann Surg Oncol*. 2022. <https://doi.org/10.1245/s10434-022-11763-2>

Publisher's Note Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.