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ESGE/ESGO/SERGS consensus statement on surgical steps in minimally invasive surgery in gynecologic oncology: transperitoneal and extraperitoneal approach for paraaortic lymphadenectomy

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► Additional supplemental material is published online only. To view, please visit the journal online (https://doi.org/10.1136/ijgc-2024-005796).

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Accepted 20 June 2024

To cite: Rovira R, Mereu L, Planchamp F, *et al. Int J Gynecol Cancer* Published Online First: [please include Day Month Year]. doi:10.1136/ijgc-2024-005796

ABSTRACT

Introduction Assessment of retroperitoneal nodes is an important part of the surgical staging of gynecologic cancers. Although pelvic and paraaortic lymphadenectomy have been widely described by different authors, there is little consensus on the description of the different surgical steps for each procedure. An Intergroup Committee on Onco-Gyn Minimally Invasive Surgery has been established with members of the European Society for Gynecological Endoscopy (ESGE), European Society of Gynaecological Oncology (ESGO) and the Society of European Robotic Gynaecological Surgery (SERGS). The Intergroup Committee has various objectives: writing down a surgical description of the technique, which will be assessed by a group of experts following a formal consensus method and developing a specific Objective Structured Assessment of Technical Skills (OSATS) scale for each procedure.

Methods A hierarchical task analysis was conducted by a working group of eight experts from the three societies in order to identify the surgical steps of transperitoneal and extraperitoneal approach in paraaortic lymphadenectomy. The selection of the definitive surgical steps was confirmed by a group of 19 experts from the different societies, following a formal consensus method. Two rounds of Delphi panel rating were considered necessary for achieving an agreement. The consensus agreement identified 29 surgical steps in transperitoneal and 17 surgical steps in extraperitoneal approach to complete a paraaortic lymphadenectomy. Once the description of the procedure and the consensus were established, an Objective specific Scale for the Assessment of Technical Skills for Paraaortic lymphadenectomy (PA-OSATS) in the transperitoneal and extraperitoneal approach was developed.

Results In the first round of rating we found that 28 steps out of 29 in the transperitoneal approach and 13 out of 17 in the extraperitoneal approach did not reach a strong degree of agreement. They were reformulated based on comments made by the experts, and submitted to a second round of rating and this finally achieved an agreement.

Conclusion We defined a list of surgical steps in transperitoneal and extraperitoneal approach in paraaortic lymphadenectomy and a specific PA-OSATS scale for these procedures. This tool will be useful for teaching, assessing and standardizing this surgical procedure.

INTRODUCTION

There is an urgent need for concerted action to set and maintain surgical standards for minimally invasive procedures such as transperitoneal and extraperitoneal approach in Paraaortic lymphadenectomy. It is well known that the standardization of the technique would reduce variation in surgical approaches and potentially improve surgical and oncologic outcomes. The learning process of a complex task in surgical practice is associated with a high cognitive load that can make it difficult to acquire surgical skills. The literature has well described how dividing a complex task into different simpler tasks can help to improve this learning process.[1] Van Merriënboer et al.,[2] described how novices learn complex tasks differently than they learn simple tasks. In terms of learning a complex task, two approaches are described: The whole-task approach, which is associated with a large amount of information, and the part-task approach, which is associated with non-integrated steps or a procedure learning mode. The balance between the two options seems to be a whole-task approach where the individual tasks are simplified to a level that is clearly understood by the learner. This approach will allow more opportunities to integrate the skills and to perform parts of the task and the whole task more efficiently. Issenberg et al.,[3] described how one of the essential aspects of the learning process is the existence of clear benchmarks and outcomes and this is only possible if performance is measured. The importance of the assessment of clinical competence is that: Assessment guides learning process (*Formative assessment*), and results are used to correct mistakes and to motivate students (*provide feedback*). Assessment certifies that the objectives of the course are achieved. Results can be used to certify that the student has the competence to perform a

procedure (*Sumative assessment*). Assessment allows the students to compare their results with others.

The chosen tool for assessment of clinical competence should[4]: allow feed-back (formative and summative), allow deliberate practice,[5] (repetitive performance of intended cognitive or psychomotor skills in a focused domain), and define outcomes and benchmarks. Martin et al.,[6] described some years ago the Objective Structural Assessment of Technical Skills (OSATS), a method that consists of the combination of a Global Rating Scale and a procedure-specific Checklist. This method has been widely used in the literature as a tool for assessment of surgical skills. Although the original work described a Global Rating Scale, it is recommended to develop a procedure-specific Rating Scale for each procedure as has been done with laparoscopic hysterectomy.[7] The objective of the present work was to identify, describe and classify the surgical steps in transperitoneal and extraperitoneal minimally invasive Paraaortic Lymphadenectomy.

METHODS

An Intergroup Committee on Onco-Gyn Minimally Invasive Surgery was established with members of three societies: the European Society of Gynecologic Endoscopy (ESGE), the European Society of Gynecologic Oncology (ESGO), and the Society of European Robotic Gynecological Surgery (SERGS). The aim was to develop the project based on three different steps:

1. Writing down a document to describe minimally invasive paraaortic lymphadenectomy by transperitoneal and extraperitoneal approach.
2. A hierarchical task analysis was conducted in order to identify the surgical steps.[8] The selection of the definitive surgical steps was assessed by a group of 19 experts from the different societies, following a formal consensus method.
3. A procedure-specific OSATS scale for each procedure was then developed.

We used formal consensus reached by experts that included two rounds of Delphi panel rating to assess and validate the documenting of surgical steps in paraaortic lymphadenectomy in both the transperitoneal and extraperitoneal approach. Eligible experts were identified by the Intergroup Committee on Onco-Gyn Minimally Invasive Surgery based on the following criteria: being key opinion leaders in the field of gynecologic oncology, especially in the microinvasive surgery (MIS) approach (laparoscopic or robotic), having active involvement in ESGE, ESGO and SERGS societies and having prior publications on paraaortic lymphadenectomy. The experts were invited to participate in the project via email and were asked to complete an online survey. Experts were asked to rate all the submitted proposals that were listed in the questionnaire. Beside each proposal on the questionnaire was a discrete numerical scale running from 1 to 9:

- A value of 1 meant that the expert considered the proposal totally inappropriate (or not indicated, or unacceptable).
- A value of 9 meant that the expert considered the proposal totally appropriate (or indicated, or acceptable).
- Values of 2 to 8 represented possible intermediate situations.
- A value of 5 meant that the expert was undecided.
- The experts were asked to provide comments, especially if they voted <7.

Score analysis – first round of rating

The appropriateness or inappropriateness of the proposal was defined by the value of the median and the distribution of all the scores on the scale of 1 to 9. Agreement among the experts was defined on the basis of the distribution of all the scores obtained: there was agreement where the scores were all ≤5 or all ≥5. A proposal was deemed:

- Appropriate with a strong agreement, when the value of the median was ≥7 and the scores were all ≥7.
- Appropriate with a relative agreement, when the value of the median was ≥7 and the scores were all ≥5.
- Inappropriate with a strong agreement, when the value of the median was ≤3 and the scores were all ≤3.
- Inappropriate with a relative agreement, when the value of the median was ≤3.5 and the scores were all ≤5.
- Of uncertain appropriateness in other situations.

Proposals deemed appropriate for which there was a strong agreement were accepted. Proposals deemed inappropriate for which there was a strong agreement were excluded. They were not submitted for the second round of rating. In other situations, a second round of rating was considered.

Score analysis – second round of rating

A proposal was deemed:

- Appropriate with a strong agreement, when the value of the median was ≥7 and the scores were all ≥7.
- Appropriate with a relative agreement, when the value of the median was ≥7 and the scores were all ≥5.
- Inappropriate with a strong agreement, when the value of the median was ≤3 and the scores were all ≤3.
- Inappropriate with a relative agreement, when the value of the median was ≤3.5 and the scores were all ≤5.
- Uncertain (no consensus) in other situations.

After the two rounds of rating, a final description of the procedures was approved.

This document was used to create a specific OSATS scale for both approaches of paraaortic lymphadenectomy, with a definition of each surgical step by tasks and subtasks (Online Supplemental Appendix 2 and 3).

RESULTS

The Intergroup Committee on Onco-Gyn Minimally Invasive Surgery was established in and set up periodic on-line meetings. The definition of surgical steps was obtained and a manuscript (Online Supplemental Appendix 1) on paraaortic lymphadenectomy was achieved with description of surgical anatomy, operative room set up, operative access and surgical steps. Only widely used approaches were taken into consideration: laparoscopic and robotic transperitoneal technique and laparoscopic extraperitoneal technique. Twenty-nine surgical steps in transperitoneal approach and 17 in extraperitoneal approach were described.

In the first round of rating, the transperitoneal approach did not reach a strong agreement in 28 out of 29 steps, of which eight did not achieve the degree of consensus, while in the extraperitoneal

approach, 13 out of 17 steps did not reach a strong agreement of which eight did not achieve the degree of consensus. None of the surgical steps in both approaches were scored as inappropriate in the first round.

All surgical steps that did not achieve a strong agreement were submitted to a second round of rating. Final agreement was achieved in all surgical steps due to some of the minimum values being excluded in the different steps following methodology previously described, and some of the steps were reformulated based on comments made by the experts. Finally, all surgical steps in both approaches found a strong agreement except for two steps in the transperitoneal approach, which was relative.

Once the final agreement was achieved, a specific OSATS scale for both approaches of paraaortic lymphadenectomy was performed, following the definition of each surgical step by tasks and subtasks (Online Supplemental Appendix 2 and 3).

DISCUSSION

Currently, surgical competency is not objectively measured in clinical practice using surgical quality assessment (SQA) tools. In surgical education, the competency of a resident to perform a specific operation independently is generally based on subjective rather than objective assessments. Since the evidence of the association between technical skills and patient outcomes is growing,[9–11] the surgical community as well as healthcare organizations are seeking solutions to objectively measure a surgeon's competence and to avoid the negative impact of variation and learning curves. Objective competence assessment is needed to improve the quality of surgery. This will lead to better performance adjusted surgical education, accommodate the certification of surgeons after successful training and help to obtain robust data in clinical trials investigating new surgical techniques.

Many different tools have been developed for surgical assessments: direct assessment in the operating room by an expert or supervisor, self-assessment after a surgical procedure and postoperative video-based assessment. Especially in laparoscopic surgery, multiple video-based SQA tools have been described, which can be divided into four main categories: (1) global assessment scales[12 13] focusing on overarching qualities such as tissue handling; (2) error-based assessment scales[14] in which errors are identified as a surrogate for the overall quality of the performance; (3) procedure-specific assessment tools[15] in which key steps and phases of the operation are assessed separately; and (4) artificial intelligence[16] machine learning algorithms which can recognize anatomical structures and movements of instruments to estimate or predict surgical quality.

Recently, a systematic review[17] concluded that global assessment scales are more useful for assessing general surgical skills during the first years of residence, meanwhile procedure-specific assessment tools enable assessment if a surgeon is able to perform different surgical steps related to a surgical procedure. Another systematic review[18] studied the relationship between surgical skill acquisition and clinical outcomes. It observed differences between the group of surgeons with higher quartile vs lower quartile of surgical skills in reoperation (odds ratio (OR): 0.44; 95% confidence interval (CI):0.23,0.83), bleeding (OR: 0.66; 95% CI, 0.65, 0.68), bowel obstruction (OR: 0.33; 95% CI, 0.30, 0.35), and any medical complication (OR: 0.23, 95% CI, 0.19, 0.27). The conclusion of the study was that the surgeon's technical skills appear to predict clinical outcomes, although unfortunately there are few articles evaluating this association.

As previously described, the learning process of a complex surgical procedure needs to follow certain steps inorder to achieve its objectives. The first step is to have a detailed description of the surgical steps, so the novice knows clearly what to do. Surgical techniques should be clearly defined, including a description of what is correct and what is not correct. Providing feed-back with an expert is also crucial. This method and how to perform it is widely described in the literature and is considered one of the most important steps to achieve.[3] Finally, the possibility of undergoing an assessment is also important since it allows the novice and expert to contrast one set of results with those of other students, provides motivatation to improve the performance of the surgical procedure and helps to assess the results on whether or not surgical competence has been achieved. Creation of procedure-specific assessment tools will allow the conversion of a subjective sensation (someone knows or does not know how to perform a surgical technique) into an objective and numerical variable (there is a description of what that numerical variable implies). By obtaining a numerical variable we will be able to compare groups who have different surgical experience.

In 2019, the ESGE established a working group with the goal of standardizing the surgical steps of total laparoscopic hysterectomy for benign disease, which is one of the most commonly performed major surgical procedures in gynecology.[19] In 2018, Knight et al., published[7] their study on the development of a specific procedural tool for the evaluation of laparoscopic hysterectomy. Their study used a Delphi method among experts and evaluation using a virtual reality simulator. Using the Delphi method and with the help of an expert panel of 76 initial tasks, 64 tasks were agreed. H-OSATS enabled constructive validity, finding differences in the outcome of the evaluation for different levels of experience. Knight et al., subsequently validated the methodology, evaluating videos of laparoscopic hysterectomies performed by surgeons at three different levels of experience.[20]

Our report is the first document from the Intergroup Committee on Onco-Gyn Minimally Invasive Surgery with members from ESGE, ESGO and SERGS. Paraaortic lymphadenectomy was chosen as a first project for its complexity and because it has two possible approaches – intra and extraperitoneal. We reached agreement after two Delphi rounds about the surgical description (divided in steps) and we developed a specific OSATS scale for each approach. Final agreement was achieved due to the modification of the text of some of the surgical steps, considering the commentaries from the experts, and the exclusion of some of the minimum values, following the methodology previously described.

These results emphasize the high percentage of agreement as well as concentration in the highest marks, between 19 experts from three societies with their own surgical experience and technical particularities. The aim of the project is to use an inclusive methodology where the most widely used approaches are included. Although this document does not pretend to describe a unique surgical performance as the correct method, it is a guideline that will guide novice surgeons in their learning process and will help

to assess what is considered to be the most accepted surgical description.

The strength of this document is that it has been written down with the support of the three most important European societies involved in surgical procedures in minimally invasive gynecologic oncology surgery. The level of agreement is high and has been achieved following a standardized method. Although a specific OSATS scale for both paraaortic lymphadenectomies is also included in the document, its validity is not proven as an assessment tool. Future studies will be designed to test it further.

CONCLUSION

A final agreement on surgical steps and a specific OSATS scale in transperitoneal and extraperitoneal approach in paraaortic lymphadenectomy was achieved among ESGE, ESGO, SERGS experts. This tool will be useful for teaching, assessment and standardization of the technique.

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Acknowledgements The authors wish to express sincere gratitude to Inés Luna Guiburg who provided invaluable support by drawing the figure describing the anatomical paraaortic landmarks. The authors thank the experts from the ESGE, ESGO, and SERGS who collaborated on the project and these three societies for their support.

Collaborators -

Contributors All authors are responsible for the decision to submit for publication. RR and CT wrote the first draft of the manuscript. All other contributors have actively given personal input, reviewed the manuscript, and gave final approval before submission.

Funding The authors have not declared a specific grant for this research from any funding agency in the public, commercial or not-for-profit sectors.

Competing interests AEB has reported grants for travelling from Olympus; AF has reported advisory boards for Johnson & Johnson, Fondazione Internazionale Menarini and Oncoinvent, research support from AstraZeneca/MSD, and speakers bureau for GlaxoSmithKline and Covidien/Medtronic; RR, LM, FP, HF, MB, DQ, and CT have reported no conflicts of interest.

Patient consent for publication Not applicable.

Ethics approval Not applicable.

Provenance and peer review Not commissioned; internally peer reviewed.

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