

# The use of the “Objective Structured Assessment of Technical Skills” as an Assessment Tool Among Danish Vascular Surgeons in Training

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**OBJECTIVE:** The concept of the Objective Structured Assessment of Technical Skills (OSATS) is to quantify surgical skills in an objective way and, thereby, produce an additional procedure-specific assessment tool. Since 2005, a 2-day practical course for upcoming specialist registrars in vascular surgery has been obligatory.

The aim of this study is to describe the results from a tailored OSATS test as a tool for the evaluation of practical skills during an intensive training session in a simple simulator box for vascular anastomoses.

**METHOD:** Between 2005 and 2013, we registered the OSATS scores of all course participants. The following data were collected from the questionnaires: years as a candidate, months in vascular surgery or in another type of surgery, and the number of vascular anastomoses performed before the course.

The assessment of surgical skills was conducted with an OSATS score template specifically made for this purpose. It consists of a 12-item table with a 5-point grading scale. OSATS score (points) and time for the procedure (OSATS time in min) were registered at baseline (OSATS I) and at the end of the course (OSATS II).

**RESULTS:** OSATS scores were given in both OSATS I and OSATS II for the 83 trainees, and the mean difference was 8.1 points (95% CI: 6.7; 9.5,  $p < 0.001$ ). OSATS time was given for 69 trainees, and the mean difference was 2.8 minutes (95% CI: 1.4; 4.2,  $p < 0.001$ ). We found no relationship between years since graduation, months in any surgical specialty, or the experience with vascular anastomoses and outcomes.

**CONCLUSION:** OSATS is a valuable tool for evaluating the advancement of technical skills during an intensive practical course in performing vascular anastomoses. (J Surg Ed

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**KEY WORDS:** Objective Structured Assessment of Technical Skills (OSATS), surgical education, surgical simulation, clinical competence, assessment tool, educational evaluation

**COMPETENCIES:** Medical Knowledge, Practice-Based Learning and Improvement

## INTRODUCTION

Over previous decades, the paradigms concerning vascular surgery training and education have changed dramatically. A large diversity in training models is observed across Europe.<sup>1-3</sup> The objective assessment of technical operating skills is difficult, as most learning is based on everyday clinical practice. The accustomed learning strategies are based on observations and assisting at operations and by performing supervised operations. The development of simulation-based training has been implemented for laparoscopy, minimally invasive procedures, knot-tying and suturing, and as well as vascular anastomosis techniques.

Reznick et al.<sup>4</sup> established the concept of the Objective Structured Assessment of Technical Skills (OSATS) to quantify surgical skills in an objective way and, thereby, produced an additional procedure-specific assessment tool. First introduced in 1975 and used in gynecological auspices, the concept of OSATS has been adopted in other specialties. An OSATS has been used and validated in relation to the European Board Examination in Vascular Surgery.<sup>5</sup>

In Denmark, vascular surgery is a relatively small specialty with 7 dedicated pure vascular departments, and the specialized training for vascular surgery lasts 6 years. The first year of this period is an introduction to vascular surgery, and it is based on specific goals that give both the

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**FIGURE 1**

trainee and the vascular surgical unit the possibility to evaluate whether the choice of specialty is the right one. Annually, there are 10 to 12 introduction posts available. A fully signed logbook from this given year is required for entering the specific 5-year specialist training program, of which there are annually 6 posts available. This specialist training program is divided into 3 parts, as the training is placed in 2 different vascular surgery departments and contains a minimum of 1.5 years at a university department.

Since 2005, all Danish vascular surgeons, during the introduction part of the training, have taken an active share in a mandatory 2-day practical course in vascular surgical technique.

The aim of this study is to describe the results from tailored OSATS scores as an evaluation tool during an intensive training session in a simple simulator box for vascular anastomoses.

## MATERIAL AND METHODS

Between 2005 and 2013, OSATS scores were registered during the mandatory vascular anastomoses course. At

arrival, the participants filled out a short questionnaire including the following information: clinical experience, in terms of number of years as a postgraduate candidate, months in vascular surgery or in another type of surgery, and the number of vascular anastomoses performed before the course. The number of anastomoses was divided into 4 subgroups (<5, 5-10, 11-20, and >20).

In the morning of the first day, all normally used operative instruments were shown and named, followed by a demonstration of the various sutures. An introduction was given to the surgical “parachute technique” to be used in the simulator box (Fig. 1) with a Power Point presentation showing the procedure step-by-step. The trainees would usually have some knowledge of the simulator box at arrival, as every vascular department in the country is in possession of one.

After lunch, each participant performed side-to-side anastomoses with the parachute technique to get accustomed to the equipment. Then the first evaluation (OSATS I) was conducted. The OSATS template was inspired by an OSATS validated in relation to the European Board Examination in Vascular Surgery, and tailored to be procedure specific for this course (Appendix).

There was at least 1 trainer for 2 trainees at each simulator box during several hours of intensive training, and each participant performed or assisted 6 simulations (Fig. 2). With the same setup as in OSATS I, OSATS II was conducted in the late afternoon. There were 2 assessors at each OSATS evaluation, and the assessors were different at OSATS II. The time consumption and the average total score from the 2 assessors were assessed.

After a social evening, where trainees from all over the country could exchange experiences, the second day was dedicated to open surgical operations on anesthetized pigs. This session was not standardized and not evaluated by OSATS.



**FIGURE 2**

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