


## Reply to comment to: Recurrence mechanisms after inguinal hernia repair by the Onstep technique: a case series

S. Öberg<sup>1</sup>  · K. Andresen<sup>1</sup> · D. Hauge<sup>2</sup> · J. Rosenberg<sup>1</sup>

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Dear Editor,

We thank the researchers for the comment [1] on our study about recurrence mechanisms after the Onstep repair of inguinal hernias [2]. The authors criticize the partly preperitoneal Onstep method and recommend a complete preperitoneal mesh position [1]. The most common inguinal hernia repairs are the Lichtenstein repair (anterior approach) and laparoscopic repairs (posterior approach with a preperitoneal mesh placement), but the chronic pain rates are high [3]. In Lichtenstein repair, both the anterior dissection and the placement of the mesh in close relation to nerves may be potential sources of chronic pain. The laparoscopic repairs avoid potential nerve damage to a greater extent, and have a lower chronic pain rate compared with Lichtenstein repairs [3]. However, pain seems to equalize after 3–4 years [3] and the etiology to pain is most likely multifactorial, depending on surgical approach, nerve damage, mesh material etc. Even though laparoscopic repairs are promising, there are problems with a long learning curve, the requirement for general anesthesia, and high cost. Therefore, we believe that a new technique is interesting, and the Onstep technique is currently assessed with regards to recurrence- and chronic pain rates.

Before implementing a new surgical repair, it should be properly investigated with well-designed randomized controlled trials (RCTs). Onstep is an anterior approach, with partly external and partly preperitoneal placement of the mesh [4]. The digital dissection, combined with no fixation of the mesh to the surrounding tissue, may theoretically result in a low chronic pain rate. Two surgeons developed the Onstep technique, and since both recurrence- and chronic pain rates were low [4], we performed further investigations of the repair with standardized assessment methods in general surgical departments across the country. A pilot study was carried out with standardized pain questionnaires and registration of recurrences [5], which justified two double-blinded RCTs. Both studies are reported according to the CONSORT statement [6] and with published protocols [7, 8]. The studies compare Onstep with Lichtenstein repair [6] and Onstep with laparoscopy [8]. With 12 months follow-up, there were no differences in chronic pain- or recurrence rates between Onstep and Lichtenstein repair [6]. Two patients had severe chronic pain after Lichtenstein repair, which made them unable to work—this was not seen in the Onstep group. New techniques require an implementation period before they are standardized, which also seems true for the Onstep repair, where the majority of the recurrences occurred early after introduction of the technique [2, 6].

We agree that new surgical techniques should be evaluated based on evidence from well-designed RCTs. The relatively new Onstep repair for inguinal hernias has indeed followed this procedure. Chronic pain- and recurrence rates do not differ between Onstep and Lichtenstein repair, and we are awaiting the results from an RCT comparing Onstep with laparoscopy. Depending on the results, Onstep might be an alternative to the standard

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✉ S. Öberg  
stina.oeborg@gmail.com

<sup>1</sup> Department of Surgery, Center for Perioperative Optimization, Herlev Hospital, University of Copenhagen, Herlev Ringvej 75, 2730 Herlev, Denmark

<sup>2</sup> Department of Surgery, Bispebjerg Hospital, Copenhagen, Denmark

inguinal hernia repairs, but it is still too early to draw such a conclusion.

#### Compliance with ethical standards

**Conflict of interest** Öberg reports no potential conflicts of interest. Andresen reports personal fees from Bard outside the submitted work. Hauge reports no potential conflicts of interest. Rosenberg reports grants and personal fees from Bard, personal fees from Merck, outside the submitted work.

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