Editorial

Elective surgery and postoperative shower: mind the gap and push the limits

Christos Tsagkaris[1]^, Marios Papadakis[2]^

[1]Department of Medicine, School of Health Sciences, University of Crete, Heraklion, Crete, Greece; [2]Department of Surgery II, University Hospital Witten-Herdecke, University of Witten-Herdecke, Wuppertal, Germany

Correspondence to: Marios Papadakis, MD, PhD. Department of Surgery II, University Hospital Witten-Herdecke, University of Witten-Herdecke, Heusnerstraße 40, Wuppertal 42283, Germany. Email: marios_papadakis@yahoo.gr.

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Surgery has always been accompanied by the feat of complications. Historically, the development of cardiac surgery has been marked by hesitancy. In 1882, Theodor Billroth, the so-called father of abdominal surgery, declared pericardiectomy "*tantamount to an act of prostitution in surgery or surgical frivolous*". Despite these reservations cardiac surgery achieved a number of milestones during the 20th century and was established as a surgical specialty and a field of inquiry worldwide (1). The onset of the 21st century has brought cardiac surgery, and several major surgical procedures alike, in front of a new challenge, the so-called concept of early mobilization.

A wealth of evidence has highlighted the need to allow patients to regain an ambient activity the soonest possible within the postoperative period. Benefits seem to outweigh risks, not only in terms of health outcomes, but also in terms of patient satisfaction, healthcare expenditure and ecological footprint of healthcare (2). Currently, early mobilization is defined as active exercise where patients use their own muscle strength and control. This includes therapeutic exercise and various types of postoperative physiotherapy, such as respiratory rehabilitation (2). Postoperative showers lie one step ahead of this, in this sense that patients not only regain every-day mobility, but they also engage actively with their personal and wound hygiene.

Traditionally, surgical patients are advised against showering until the sutures are removed from their wound. This practice is thought to protect them from complications such as wound dehiscence and superficial or deep surgical site infection. These are common and burdenful complications for all types of surgery, and notably for cardiac surgery, where postoperative mediastinitis is associated with an up to 47% mortality rate (3). Many physicians consider that early postoperative showers increase the risk for infections due to either the direct opening of the wound or the potential of residual moisture to enhance the proliferation of pathogens on the surgical site. In the absence of relevant evidence, the empirical recommendation for showering varies from 48 hours to 2 weeks after the operation. During the last years, a growing number of studies has attempted to question this notion (4,5).

In this context, Yoo *et al.* report their experience with early postoperative showering after cardiac surgery, their prospective observational study suggests that this is associated with increased patient's satisfaction, whereas no increased wound complication rates were observed (3). Although the study has the limitations of lack of randomization, of a heterogeneous group of patients treated with different surgical approaches and several skin closure techniques, its findings are valuable for a number of reasons.

First, Yoo *et al.* [2022] build upon the existing literature on postoperative showering (3). This literature is summarized in three systematic reviews and metanalyses

^ ORCID: Christos Tsagkaris, 0000-0002-4250-574X; Marios Papadakis, 0000-0002-9020-874X.

published between 2013 and 2020. One relevant Cochrane review dating back to 2013 and its update on 2015 listed only one randomized clinical trial (6). Although it indicates that early postoperative showering does not significantly increase the risk for complications, it does not reach a definitive conclusion due to methodological flows in the examined study. Yu *et al.* [2018] and Copeland-Halperin [2020] analyzed more clinical studies including between 1,000 and 4,000 patients and found no increase in the risk of complications associated with early postoperative showering (4,5). Yu and colleagues also stressed the higher level of satisfaction among patients who were able to shower earlier than anticipated. The aforementioned studies included patients regardless of the type of surgical interventions (5). Hence, Yoo and colleagues seem to confirm these findings in the context of cardiac surgery (3).

Further, Yoo *et al.* [2022] provide more insights with regard to the time and the prerequisites of early postoperative showering (3). The definition of "early" differs significantly due to inherent differences between surgical fields and types of operations. The study of Yoo and colleagues comes up with a cardiac-surgery focused answer to this question. In heart surgery, the removal of drains and pacing wires, enables the patients to safely shower in tap water without applying pressure to the wound (3). Therefore, the removal of devices that create communication between internal organs or cavities and the external environment appears as a safe limit for early postoperative showering. This notion has been recently challenged by a study in patients undergoing breast surgery, where Ogawa *et al.* [2022] showed no increased risk for complications when patients with closed suction drains showered (7). The safety trade-off in this study was two or less connected tubes, either to the abdominal donor site or to the reconstructed breast (7). Although, a head-to-head comparison with cardiac surgery is not feasible, this study leaves room for evaluating showering in patients with a limited number of closed drain tubes.

Overall, universal application of early postoperative showering, regardless of various surgical indications, might be feasible in the future. While a particular number of days is difficult to be defined, setting a limit related to the presence of water sensitive or water conducting devices such as wires and drains seems more realistic and translatable to other types and fields of surgery. Replicating these studies in pediatric populations and examining whether the results are similar should be prioritized in the future. Translating the existing evidence into national and local guidelines encouraging early postoperative shower can help decrease hesitancy among surgeons and allied healthcare professionals.

The potential of early postoperative showers extends beyond surgical-site infections. Empowering patients to take control of their hygiene in the first hours or days of postoperative recovery is a major step towards the implementation of self-care in surgery. The World Health Organization has lately prioritized the latter aiming to improve health outcomes among populations with limited access to healthcare, namely postoperative outpatient visits when it comes to surgery (8). In the context of early mobilization, patients and healthcare systems are also likely to benefit from decreased healthcare costs and lower healthcare-related environmental pollution. Lower direct healthcare cost enables healthcare providers to invest their gains in emerging aspects of postoperative care including community and remote surgical care. Similarly, a reduction in out-of-pocket expenses for postoperative monitoring will be a relief for patients dealing with post-COVID inflation and food and energy crises worldwide (9). Finally, yet importantly, harnessing postoperative showers as a leap towards environmentally sustainable surgery, is a major priority given that surgery constitutes the most energy-intensive aspect of healthcare (10). Certainly, the pursuit of the above goals should respect the need for evidence-based continuous monitoring of the safety and effectiveness of early postoperative showering.

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