

COMMENTARIES ON MEDICAL INNOVATIONS, NEW TECHNOLOGIES, AND CLINICAL TRIALS

Scrotal cooling as a protective method in tissue preservation after testicular torsion

Marko Bašković¹, Nikola Knežević², Davor Ježek³

¹Department of Pediatric Urology, Children's Hospital Zagreb, Zagreb, Croatia

²Department of Urology, University Hospital Centre Zagreb, Zagreb, Croatia

³Department of Histology and Embriology, University of Zagreb, School of Medicine, Zagreb, Croatia

Article history

Submitted: Oct. 4, 2021

Accepted: Oct. 23, 2021

Published online: Nov. 6, 2021

Citation: Bašković M, Knežević N, Ježek D. Scrotal cooling as a protective method in tissue preservation after testicular torsion. Cent European J Urol. 2021; 74: 601-602.

Key Words: scrotal cooling ◊ testis ◊ torsion

Dear Editor,

In our environment, we continue to witness that surgeons, after emergency scrotal exploration and detorsion, heat the testicles. Most surgeons are still guided by the view that heating the testicles dilates peripheral blood vessels, thereby promoting reperfusion and recovery of testicular tissue. Most often, after detorsion, before fixation, surgeons wrap the testicles with warm gauze, waiting for the testicles to 'recover'. They find the fact of recovery in a visual change in the colour of the testicles, from darker to lighter. We also witness that in clinical practice, from the moment of suspicion of testicular torsion to the operation itself, many surgeons do nothing to preserve testicular tissue, although we are aware that every minute of ischemia is harmful to testicular tissue.

As early as 1990, it was shown that the application of an ice bath to the ischemic testis, after 30 minutes of normothermic ischemia, significantly improves the vitality of the germinal epithelium [1]. It has been unequivocally found that lower temperature favourably affects pH, lactate values and testicular tissue morphology itself. Acidification is reduced, while the increase in lactate concentration is reduced by a decrease in temperature [2]. The protective effects of hypothermia, in ischemic testes, are reflected in histological and tubular changes. Cold rather than warm ischemia has been shown to be essential for

the maintenance of morphologically and functionally normal Sertoli and Leydig cells [3, 4]. A better Cosentino score was recorded in the groups where hypothermia was performed [5]. Also, oxidative stress indicators, such as MDA, MPO, and SOD, are significantly lower in both serum and tissue after hypothermia, while antioxidant indicators such as GPx and CAT are significantly higher [6]. In the domain of all research on this topic, the temperature of 4°C proved to be the most optimal.

The issue of ice use has already been mentioned in the late 80's [7], and emphasized in the 90's [8], but to this day we are witnessing that surgeons in our environment do not use the cooling method either before or after surgery. We want to emphasize that surgeons should seriously consider starting to use cold compresses immediately upon admission of a patient to the hospital, but also after detorsion in order to preserve testicular tissue as much as possible. Physicians of all other professions, especially family physicians and emergency physicians who frequently encounter this condition, should also be informed that in patients with suspected testicular torsion, cold compresses on the scrotum may have a protective effect on the course of treatment.

CONFLICTS OF INTEREST

The authors declare no conflicts of interest.

References

1. Miller DC, Peron SE, Keck RW, Kropp KA. Effects of hypothermia on testicular ischemia. *J Urol.* 1990; 143: 1046-1048.
2. Kallerhoff M, Gross AJ, Bötöfür IC, et al. The influence of temperature on changes in pH, lactate and morphology during testicular ischaemia. *Br J Urol.* 1996; 78: 440-445.
3. Sarica K, Bakir K. Semiquantitative evaluation of testicular histology after testicular torsion: protective effect of external cooling. *Urol Int.* 1999; 63: 110-114.
4. Young GP, Goldstein M, Phillips DM, Sundaram K, Gonsalus GL, Bardin CW. Sertoli cell-only syndrome produced by cold testicular ischemia. *Endocrinology.* 1988; 122: 1074-1082.
5. Haj M, Shasha SM, Loberant N, Farhadian H. Effect of external scrotal cooling on the viability of the testis with torsion in rats. *Eur Surg Res.* 2007; 39: 160-169.
6. Erdem AO, Coşkun ÖD, Başer AT, et al. Comparison of the effects of intermittent reperfusion and hypothermia in preventing testicular ischemia-reperfusion injury in the testicular torsion model in rats. *J Pediatr Urol.* 2019; 15: 617-623.
7. Boyarsky S. Scrotal cooling and testicular torsion. *J Urol.* 1989; 141: 960.
8. Uner AB. Testicular torsion: why not cool ischemic tissue? *J Emerg Med.* 1996; 14: 635-636. ■

Correspondence

Marko Bašković
baskovic.marko@gmail.com