

# Anti-thrombotic treatment as an objective method in the evaluation of testicular viability

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In current clinical practice, we witness that surgeons, after emergency scrotal exploration and detorsion, continue to wait for 10–30 minutes, and finally decide on the type of surgery based on the colour of the testicle. Orchiectomy is considered for testicles that are cyanotic or black. If the blood perfusion of the testicle is unsatisfactory, many surgeons will wait up to 10 minutes after incising the testicular tissue deep to the medulla, then they will remove the testicle whose cut surface has no fresh arterial bleeding. During the entire procedure, the thing that surgeons do most is waiting. The fate of the testicle depends solely on the discretion and experience of surgeons due to a lack of objective criteria defining testicular vitality.

A retrospective study that reevaluated orchiectomy specimens of patients with testicular torsion revealed that histopathological injury of about 10% of the testicles were reversible, i.e. these testicles should have been saved [1]. Another study with a larger sample size showed an 8.8% incidence of reversible injury [2]. Woodruff [3] performed orchiopepy on a subjectively dead isolated testicle; surprisingly, the patient's testosterone and intratesticular

blood flow were at normal levels at 4 and 12 weeks after surgery. Therefore, surgeons have a responsibility to try to save subjectively necrotic testicles.

Local clogging by the thrombus seems to be the main reason for insufficient perfusion after detorsion. As early as 1985, it was shown that, after testicular torsion, most of the testicular blood vessels were blocked by blood cells [4]. Thrombosis in the testicle during testicular torsion was seen by ultrasound in Rattansingh's study [5]. In 2016, the concept of thrombosis during testicular torsion was demonstrated in animal models, and anti-thrombotic treatment can reduce testicle ischaemia/reperfusion injury [6]. Thrombosis caused by testicular torsion may be related to neutrophil extracellular traps [7].

Until today, surgeons continue to use subjective macroscopic methods to decide whether to remove the testicle. However, more and more studies have shown that these methods are not entirely correct, and that the application of these methods causes surgeons to remove testicles that should be kept. We would like to emphasise that we need to develop more objective criteria for defining testicular

viability, and that anti-thrombotic treatment may be a viable option. Existing methods for assessing testicular tissue viability should also be used with caution by physicians in other professions. Anti-thrombotic treatment can help restore sufficient

blood perfusion to severely ischaemic testicles and reduce the testicular excision rate.

#### CONFLICTS OF INTEREST

The authors declare no conflicts of interest.

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