

## Low-intensity extracorporeal shockwave therapy in the treatment of erectile dysfunction after penile trauma

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### ABSTRACT

In urology low-intensity extracorporeal shockwave therapy (LI-ESWT) finds major application in the treatment of erectile dysfunction (ED) after nerve-sparing radical retropubic prostatectomy and Peyronie's disease. We presented a rare case of application of LI-ESWT in a 39-years old man with erectile dysfunction after penile trauma obtained during sexual intercourse.

### Introduction

The incidence of sexual penile traumas is under-reported because often patients do not want medical attention due to psychological and ethical reasons. According to the American Association for the Surgery of Trauma the penile injuries are 5 types: cutaneous contusion, Buck's fascia laceration without tissue loss as in our case, cutaneous laceration through glans/meatus/cavernosal or urethral defect <2 cm, cavernosal or urethral defect >2 cm/partial penectomy and total penectomy. The European Association of Urology in Guideline 2019 provides us with an algorithm for the treatment of ED in such cases. First we have to start with phosphodiesterase-5 inhibitors, topical/intraurethral alprostadil, vacuum device or LI-ESWT. LI-ESWT induces mechanical stress and microtrauma (shear stress). This leads, on the one hand, to the production of non-enzymatic nitric oxide from endothelial cells and, on the other, to the release of angiogenic factors leading to neovascularization and cell proliferation. If we do not have an adequate treatment outcome we have to continue to intracavernosal injections and finally to penile prostheses.

#### Case report

We present a case of a 39-years old man who during stormy sexual intercourse gets a sudden acute pain in the penis. Due to the inconvenience, the patient visits a urologist after two days. The physical examination revealed the presence of a hematoma located on the dorsal surface of the penis [Fig. 1](#). The ultrasound examination revealed no rupture of the cavernosal tunica albuginea [Fig. 2](#). Non-steroidal

analgetics and ice-packs were administered to the patient. The patient was called for a follow-up examination after one month. The physical examination revealed that the penis had no visual and palpatory changes, but the patient reported an ED. Complete blood count, blood glucose, cholesterol, triglycerides and testosterone were undertaken. All results were within the reference range. Urine test showed no bacteria. International Index of Erectile Function (IIEF-5) was calculated. The result showed 16 points, which corresponds to a mild to moderate ED. We prescribed phosphodiesterase-5 inhibitor - tadalafil 5 mg once daily for a period of 3 months. At the follow-up examination after three months, the patient reported a slight improvement in erection but noticed a deviation of the penis to the right during the erection. Measurements revealed a mild deviation of the penis on the right – 20°, and IIEF-5 score was 19 points, which corresponds to a mild degree of ED. Based on these results, after talking with the patient, a decision was made to stop taking tadalafil and initiate LI-ESWT. The prescribed therapy was for a period of 8 weeks, in 5 positions of the penis: in the proximal, middle and distal part of the dorsal surface of the body of the penis ([Fig. 3](#)), as well as in the left and right legs of the cavernous body. At each point 600 strokes were exposed, a total of 3000 strokes per procedure. At the follow-up examination after 2 months the patient reported improvement in erection and deviation. The measurements showed IIEF-5 - 22 points, which corresponds to normal erectile function and a residual deviation of 10°, which does not disturb the patient.

### Discussion

At present, phosphodiesterase-5 inhibitors are the most widely used

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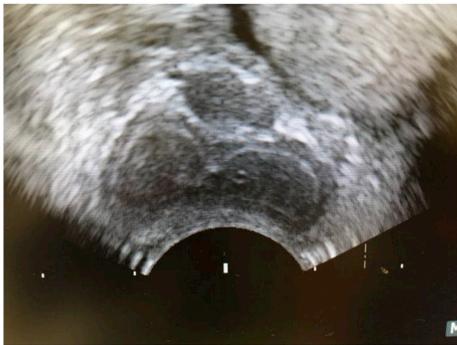
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**Fig. 1.** Hematoma located on the dorsal surface of the penis.



**Fig. 2.** The ultrasound examination revealed no rupture of the cavernosal tunica albuginea.



**Fig. 3.** Low-intensity extracorporeal shockwave therapy of the dorsal surface of the penis.

agent for the treatment of ED, independently of etiology. Despite their

undisputable effectiveness, these drugs may not always correct all the changes that have occurred in the pathophysiology of the penis due to various causes. This requires the search of new methods for recovery of EF in these patients. Shock wave therapy has established as such method in recent years. A shockwave is a type of acoustic wave that carries a certain energy and, depending on its strength, can cause destruction or stimulation of regenerative processes in tissues. Extracorporeal shock wave therapy was first applied in 1980 for lithotripsy of kidney stone.<sup>1</sup> Since then, this method has been rapidly developing, with the development of devices for LI-ESWT. Initially, they have been used in the treatment of musculoskeletal disorders,<sup>2</sup> severely healing wounds<sup>3</sup> and Peyronie's disease.<sup>4</sup> For the first time the use of LI-ESWT in the treatment of ED has been reported in 2010 by Vardi et al.<sup>5</sup> The experience of international clinical trials with LI-ESWT over the last 10 years demonstrates its undeniable safety, efficacy and good tolerability in the treatment of ED, independently of the etiological cause. The presence of ED in combination with penile deviation gave us reason to offer the patient LI-ESWT. Our results confirm the positive data presented in the literature on the effectiveness of the methodology.

### Conclusion

The case described by us shows that LI-ESWT is an effective, safe and well-tolerated technique in case of penile trauma combined with deviation. This method could be another alternative to penile rehabilitation in patients who have suffered such injuries. To confirm the results, a longer-term study involving more patients is needed.

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