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CLINICAL VIGNETTE

Treatment of female stress urinary incontinence after pelvic trauma

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INTRODUCTION

Pelvic fractures (most often due to falls or motor vehicle collisions) generate bone and ligament instability [1, 2]. Stress urinary incontinence (SUI) is the most common genitourinary consequence of pelvic insult, and SUI after pelvic trauma is almost six times greater than in the general population [3]. The “gold standard” in SUI therapy is the minimally invasive and highly effective retropubic mid-urethral sling procedure (TVT). A 2019 network meta-analysis of over 21,000 women from 175 trials reported SUI cure rates of 89.1% for TVT and 64.1% for TOT) [4]. The aim of the study was to assess the efficacy of TOT in a case of SUI following traumatic pelvic injury.

CASE PRESENTATION

Our patient is a 47-year-old female with a history of a motorcycle accident resulting in pelvic fracture with pubic symphysis diastasis and instability of sacroiliac joint. Computed tomography (CT) scans of the pelvis showed significant pubic symphysis diastasis (61 mm diameter — indicated by the arrows — Fig. 1A) and pelvis rotation right and upwards. CT imagery also revealed displaced fracture of the inferior right pubis ramus (Fig. 1B). Due to sharp bone dislocation, the urinary bladder wall was perforated (Fig. 1C, the horizontal blue line depicts measurable difference in greater trochanters positioning — resulting in irregular

lower extremities lengths). Beyond right and left sacroiliac joint dislocations, the obturator canals were also displaced and rotated, and 3D CT angiography showed disrupted pubic bones position and changed location of greater vessels (Fig. 1D).

Despite heparin treatment, prolonged immobilization contributed to pulmonary embolism (treated in the Intensive Care Unit). This included further anticoagulants implementation and inferior vena cava filter placement (indicated with the arrow — Fig. 1D). Bladder perforation arising from bones fracture was treated via Foley catheter without expected effect. After three weeks of catheterization, the Urologic team conducted a laparotomy and sutured the bladder. Per Orthopedic team recommendations, the patient was scheduled for external pelvis fixation. Nevertheless, despite stabilization, pelvic fracture malposition still impinged on the bladder, causing re-injuring. The fixation was removed, and the bladder was re-sutured four weeks after. Due to prolonged bladder healing, the Orthopedic team withdrew from surgical pelvic reconstruction.

Patient recovery and mobilization was assisted by therapeutic rehabilitation, giving effective results. The patient, however, reported SUI symptoms, and SUI diagnosis was proved through urodynamic testing. We thus decided to conduct TOT, as pubic diastasis and the diastasis location of the urinary bladder precluded TVT sling procedure or Burch colposuspension. Pre-procedure, we studied the CT angiography to avoid hypothetical vessels damage. The video shows the TOT procedure was performed.

Our patient was assessed utilizing two different questionnaires on urinary incontinence symptoms pre-surgery and three times post-surgery (at 3, 12 and 20 months). Urogenital Distress Inventory-6 (UDI-6), Incontinence Impact Questionnaire-7 (IIQ-7) were used to ascertain the symptoms of UI and impact of dysfunction on patient quality of life [5] In Figure 1E, the result of UDI-6 is marked with a red line. Accordingly, post-surgery, our patient stayed below the cutoff score of 33.33 determined for asymptomatic women. In Figure 1E, the result of IIQ-7 is marked with an orange line. Accordingly, the patient does not meet the optimal cutoff for asymptomatic women of 9.52 in any score. However, as indicated by post-surgery questionnaire, vast improvement in well-being occurred. This also corresponds with a subjective self-reported improvement.

DISCUSSION

According to Welk et al. [3], the risk of stress urinary incontinence following pelvic trauma is 5.8 times greater than in the general population. Unfortunately, little is known about

female patients who have suffered pelvic fractures in general. About 70% of such patients develop pelvic floor dysfunction symptoms, but most do not seek treatment [6].

Related case reports on SUI management after pelvic trauma exist in current literature. Nixon et al. [2] demonstrated the TVT sling procedure in a 75-year-old patient after pelvic trauma with successful resolution of SUI, verified by postoperative retrograde voiding trial. However, no additional follow up was presented, so comparison with our case is difficult. Kùpeli et al. [7] reported on a 47 year-old female with left ischial and pubic bone fractures after traffic accident. Thirteen years post-accident, she sought medical help because of urge and stress urinary incontinence. Symptoms were found to be partially caused by a bone fragment protruding from the left ischium and pressing upon the bladder. The patient underwent bladder neck suspension by Marshall Marchetti Krantz after the excision of the irritating bone spur. Unfortunately, similarly to the previous case, the follow up included only 6 postoperative days, and the statement that she voided with minimal SUI complaints [7]. The PubMed base does not contain any other relevant literature.

Our study limitation is that it is a case report, and diagnostic methods and procedure are specific. Moreover, while we present 20 months follow-up using validated questionnaires, the lack of long-term patient follow-ups in other cases renders impossible a reliable comparison of treatment results. Per Global Burden of Disease, in 2019, about 6 million patients suffered from pelvic fracture world-wide [8]. This suggests that many doctors and patients will face similar problems.

CONCLUSIONS

We found TOT procedure after pelvic trauma to be an effective surgical treatment. The individual approach to the patient enabled a promising long-term result. Given the presented case report, further investigation within a larger population is necessary to determine the most effective procedures for SUI patients after pelvic trauma.

Article information and declarations

Ethics statement

This study was approved by the Institutional Review Board. Written informed consent was obtained from the patient for publication of this Video article and all accompanying images.

Author contributions

O.P. — 20%, S.W. — 20%, P.S. — 10%, K.S. — 10%, A.S. — 10%, A.A.G. — 30%.

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Supplementary material

Video available on https://journals.viamedica.pl/ginekologia_polska/article/view/gpl.96277

Conflict of interest

The authors have no conflicts of interest to declare.

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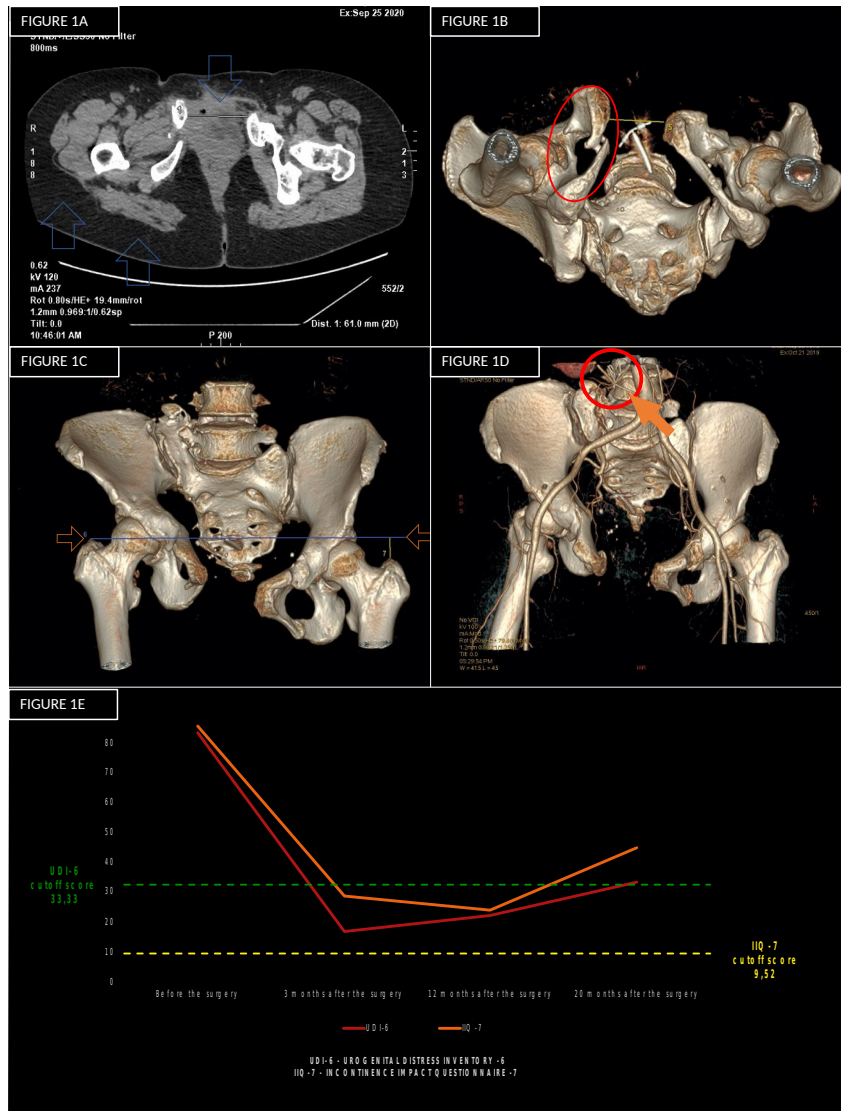


Figure 1. **A.** Computed tomography (CT) scan of the pelvis; **B.** CT image of displaced fracture of the inferior right pubis ramus; **C.** CT image showing the difference in the positions of great trochanters; **D.** 3D CT angiography showing location of great vessels; **E.** Changes in the total UDI-6 and IIQ-7 scores before and after the surgery