






# A Fournier's Gangrene Case Due to Misplaced Urethral Catheter and Urethroplasty with Saphenous Vein and Singapore Flap

## Sondanın Üretrada Şişirilmesine Bağlı Gelişen Fournier Gangreni-Singapur Flebi ve Safen Veniyle Üretroplasti

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**ABSTRACT** Fournier gangrene is a serious infection which requires immediate treatment. This condition is manifested by involving perineal, genital and perianal regions in the form of necrotizing fasciitis with high mortality. There are many reconstruction options available for defects that occur after urgent debridement surgery, which commonly do not accompany with urethral defect. In the current case, we aimed to present a successful reconstruction of the urethral and scrotal wide area defect with the saphenous vein graft and Singapore flap in a schizophrenic patient.

**Keywords:** Fournier gangrene; saphenous vein; singapore; surgical flaps

**ÖZET** Fournier gangreni az rastlanan, yüksek mortalite ile seyreden ve perineal, genital ve perianal bölgeleri tutarak nekrotizan fasiit şeklinde hızlı yayılarak acil cerrahi tedavi gerektiren gangrenöz bir enfeksiyondür. Acil debrütman sonrası gelişen defektlerde, çok sayıda rekonstrüksiyon seçeneği mevcut olmakta ve bu duruma sıklıkla üretra defekt eşlik etmemektedir. Sunulan olguda, geniş üretra ve skrotum defekti mevcut olan şizofrenik bir hastada safen ven grefti ile üretra rekonstrüksiyonu ve skrotum defektinin Singapur flebi ile başarılı rekonstrüksiyonu sunulacaktır.

**Anahtar Kelimeler:** Fournier gangreni; safenöz ven; singapur; cerrahi flepler

Fournier's gangrene is a gangrenous infectious disease, which can involve other adjacent or surrounding perineal, genital and perianal tissues and may spread from the lower extremity to the chest region in the form of necrotizing fasciitis with a rare but high mortality and morbidity rates.<sup>1</sup> For this reason, it requires urgent surgical debridement intervention. Fournier's gangrene is a polymicrobial infection caused by aerobic and anaerobic bacteria, which can more frequently occur in males. The progression of this insult can involve the deep fascia layer in a short time interval and may lead to serious skin/soft tissue necrosis in large areas. Treatment includes serial debridement of necrotic tissue, deep tissue culture and administration of broad-spectrum parenteral antibiotics. Reconstruction of skin and urethral defects is generally planned after the acute phase of the disease is recovered. According to the defect condition of urethra, buccal mucosa or skin grafts can be used for partial defect reconstruction, whereas vein grafts are replaced in case of complete urethral layer defects.<sup>2,3</sup> Skin grafts, fasciocutaneous/myofasciocutaneous flaps and testicular pockets in the groin are commonly performed methods in urethral skin defect treat-

ment.<sup>4,5</sup> In the current case, we aimed to present a combination of urethral and scrotal defects secondary to Fournier's gangrene, which was reconstructed with vein graft and Singapore flap.

## CASE REPORT

A male schizophrenic patient at 52 old, who was living under home nursery care conditions has admitted to the emergency service with bad scented wound complaint in genital region. During the initial examination, clinical manifestations of excessive swelling of the bladder (globe vesicale) and Fournier's gangrene were observed. It has also been turned out that a permanent urinary catheter was inserted to facilitate the patient care, which inflated in penile urethra. The inflated catheter was removed, however we could not able to place a new urethral catheter again. For this reason, a percutaneous cystostomy catheter was inserted instead. The patient has undergone an urgent surgical debridement intervention in urology department service of our hospital. Excision procedure was applied to gangrenous necrotic area of 15x12 cm and tissue necrosis located in penile urethral segment with three cm in diameter. Following this, routine serial debridement care was performed daily. Uncovered testicular and spermatic cord region were protected with wet dressings and the wound care was performed until the development of granulation tissue (Figure 1). After the normalization process in clinical manifestation and laboratory findings, reconstruction intervention was planned for scrotal

and urethral regions. For initial process, an extended Singapore flap tissue superior to inguinal ligament with length and width of 18 and 8 cm respectively, was elevated from the Left Anterior Superior Iliac Spine. During the flap surgery, the left great saphenous vein was dissected at six centimeters length from the femoral vein spill and taken as graft (Figures 2, 3). Urethral edges were refreshed and an urine catheter at 16 F size was placed in the bladder and inflated by passing through the distal urethra, vein graft and proximal urethra. Proximal and distal urethral anastomoses were also performed. The Singapore flap has been tightly adapted around the grafted segment of urethra. The entire defective area was covered via scoring the scrotal skin and Singapore flaps together. The flap donor site was primarily closed and a pillow was

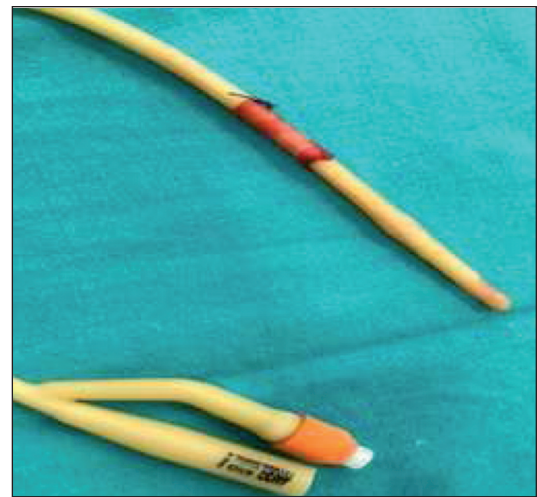


FIGURE 2: Left saphenous vein graft.

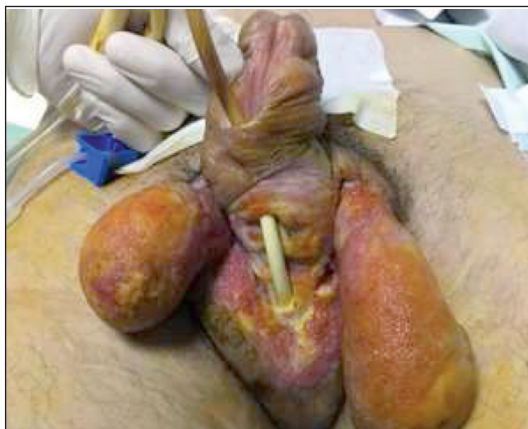


FIGURE 1: Patient's urethra and scrotum defects.



FIGURE 3: Vein graft covered with Singapore flap.

placed under the left thigh to reduce the wound stretch. Follow-up was made by performing daily dressing change. A small distal flap necrosis developed at 8<sup>th</sup> day after the intervention and it was immediately treated by debridement and flap advancement closure. Our patient was discharged from the hospital at 15<sup>th</sup> day following the surgical operation with full remission. A retrograde urethrography imaging was performed ten weeks after the operation and the vein graft was clearly visualized (Figures 4, 5). During the latter follow-up visits, no wound dehiscence or urethral fistula was observed in surgical intervention fields. Besides contracted bladder, vesicu-ureteral reflux on right side and infectious condition were also present in our patient, which were due to intermittent catheter use. For this reason, antibiotics and anticholinergic treatment were initiated.

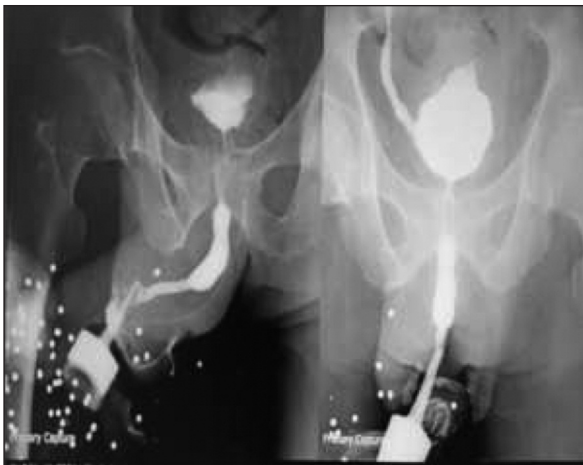


FIGURE 4: Patient's Urography 10 weeks after operation.



FIGURE 5: Patient's view postop 10 weeks.

## DISCUSSION

Fournier gangrene was firstly described by Fournier in 1883 as an idiopathic disease and has been proven to be caused by local factors such as infection, trauma, surgery or tumor.<sup>1,4-6</sup> There are various predisposing factors like diabetes mellitus, chronic alcoholism, immunodeficiency and peripheral vascular disease.<sup>2,7</sup> Tissue ischemia related to small and large vessels diseases, tendency to rapid bacterial spreading and frequent urinary system infections due to phagocyte suppression have been supposed to be involved in underlying mechanism of Fournier gangrene. The incidence of Fournier's gangrene is ten-folds higher in males and it gets increased with aging.<sup>7</sup> Clinical manifestation and complaints generally occur between 2-8 days. Initially, a genital perineal ulceration is seen with pruritis and discomfort senses, which is commonly followed by the addition of erythema and edema. These findings turn into crepitation, wet/dry necrosis and finally demarcation line. This insult is diagnosed with clinical findings and the definitive method of diagnosis is to observe a subcutaneous gas accumulation in superficial ultrasonography.<sup>8,9</sup> In Fournier's gangrene, primary treatment goals are to overcome predisposing factors, to remove necrotic tissues by urgent surgical debridement intervention, administration of antibiotic agents with broad-spectrum and reconstruction of resulting defects with appropriate methods.<sup>5,9</sup> In our case presentation, Fournier's gangrene has occurred as a result of an urethral laceration and compression wound due to inflating urethral catheter. Penile skin/buccal mucosal grafts are usually and venous grafts are rarely used in urethral defect reconstruction operations.<sup>2,3</sup> While we were planning the surgical treatment of this case, we have taken into consideration the general hygienic personal care of the patient along with the short- and long-term complications that may be encountered after the intervention. Urethral reconstruction was performed using saphenous vein-graft. In Fournier's gangrene cases, repair process of the perineal and penile defects is very important and sometimes can be very troublesome. A considerable number of re-

constructive options have been described for this region.<sup>4,10,11</sup> Adhering to general reconstructive principles; primer repair in small diameter defects, grafts in wounds which non-primerly repairable with good granulation tissue, and flap options in wounds with exposed organs.<sup>11</sup> The scrotal region and its reconstruction is still a matter of debate, because it is a very important point to protect the spermatogenetic functionality of testicular tissue. Thus, there are many flap options including facio-cutaneous thigh flap, groin flap, gracilis muscle, muscle-skin flap, rectus abdominis muscle flap and anterior-lateral thigh flap, which are used and defined for scrotal reconstruction.<sup>12</sup> In the current case, the patient had a large scrotal defect and the requested flap was 8x18 cm in size, with neuro-vascular supply and thinness features. Urethral defect was planned to be reconstructed with vein graft, so we preferred to use a flap originated from perineal and inguinal regions. The reason why we have used a venous graft for repair is that it has a longer sustainability and fast epithelization capacity along with having no hair follicle feature. For this process, we have referred to the Pudendal Thigh Flap (Singapore Flap) method, which was introduced by Wee JT and Joseph VT in 1989 for vaginal and perineal region reconstruction.<sup>13</sup> As a result, a satisfactory cosmetic result has been established in our case. Singapore flaps can be preferred for the large

defects of the penile and scrotal region secondary to Fournier's gangrene. When urethral defects also accompany with the condition, this method can obtain some advantages such as harvesting both flap and vein grafts from a single surgical site, dissection comfort, large size elevation possibility and protected neurovascular features, which in turn make this technique favorite.

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#### Conflict of Interest

*No conflicts of interest between the authors and / or family members of the scientific and medical committee members or members of the potential conflicts of interest, counseling, expertise, working conditions, share holding and similar situations in any firm.*

#### Authorship Contributions

**Idea / Concept:** Bekir Aras; **Design:** Anvar Ahmedov, Mehmet Sevim; **Supervision / Consultancy:** Sahin Kabay; **Data Collection and / or Processing:** Mehmet Sevim; **Analysis and /or Comment:** İsmail Aksu; **Resource Scanning:** Mehmet Sevim; **Writing of the Makalen:** Anvar Ahmedov, Bekir Aras; **Critical Review:** Mehmet Sevim, Şahin Kabay; **Resources and Funding:** Mehmet Sevim, İsmail Aksu; **Materials:** İsmail Aksu.

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