

# A Case of Knotted Foley Catheter in a 59-Year-Old Intensive Care Unit Patient: Challenges and Management

## 59 Yaşında Yoğun Bakım Hastasında Düğümlemiş Foley Kateter: Zorluklar ve Yönetimi

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**ABSTRACT** Urethral catheterization is widely performed procedure in patients of all age groups for various medical purposes, including the collection of urine samples, clean intermittent catheterization, daily urine output monitoring, relieving urinary retention, and performance of a voiding cystourethrography. Although some minor complications namely pain, bleeding, fever etc. can be encountered after this procedure, one rare complication is the formation of knots in the catheter within the bladder. This can occur when a relatively thin, flexible catheter is advanced too far into the bladder. Highly limited cases reported in the literature typically involve young male children where feeding tubes, placed for diagnostic and therapeutic purposes, became knotted. Here, we present a rare complication involving a knotted Foley catheter in the bladder in a 59-year-old female patient being treated in the intensive care unit. We aimed to discuss the encountered challenges and management strategies in light of the available information in the literature.

**Keywords:** Foley catheter; knotting; catheter complications

**ÖZET** Üretral kateterizasyon, idrar örneklerinin toplanması, temiz aralıklı kateterizasyon, günlük idrar çıkışı izleme, idrar retansiyonunu giderme ve işeme sistoüretrografisi gerçekleştirme gibi çeşitli tıbbi amaçlarla tüm yaş gruplarındaki hastalarda yaygın olarak yapılan bir prosedürdür. Bu prosedür sonrasında ağrı, kanama, ateş gibi bazı minör komplikasyonlar görülebilse de nadir bir komplikasyon olan mesanede kateterin düğümlenmesi de meydana gelebilir. Bu durum, nispeten ince ve esnek bir kateterin mesaneye fazla itilmesiyle oluşabilir. Literatürde bildirilen son derece sınırlı vakalar, tanısal ve terapötik amaçlarla yerleştirilen beslenme tüplerinin düğümlendiği erkek çocukları içermektedir. Burada, yoğun bakım ünitesinde tedavi gören 59 yaşındaki bir kadın hastada mesanede düğümlenmiş bir Foley kateteri içeren nadir bir komplikasyonu sunuyoruz. Literatürdeki mevcut bilgiler ışığında karşılaşılan zorlukları ve yönetim stratejilerini tartışmayı amaçladık.

**Anahtar Kelimeler:** Foley kateter; düğümlenme; kateter komplikasyon

Foley catheters are widely used in clinical practice for urinary drainage. These catheters are made from highly flexible and soft materials to minimize trauma to the urothelium. While they are generally safe for routine use with limited minor problems, complications such as catheter knotting are extremely rare but can present significant challenges.<sup>1</sup> Flexible catheters can become knotted within the bladder if advanced too far, potentially causing serious urethral

trauma when attempts are made to remove them. We present a female case in which a knotted Foley catheter was detected in the bladder.

### CASE REPORT

A 59-year-old female patient, admitted to the intensive care unit (ICU) due to respiratory failure, had a Foley catheter inserted upon admission. A few days later, ICU staff encountered difficulties deflating the

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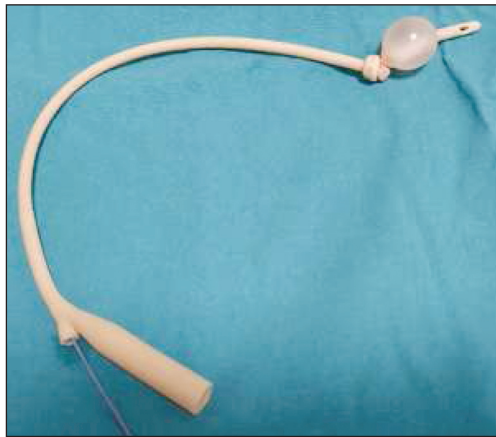


FIGURE 1: Postoperative view showing the retrieved Foley catheter.

catheter balloon for removal, and after a failed attempt to remove the catheter, a urology consultation was requested. Bedside ultrasound was performed, and no obvious abnormalities were detected. The Foley catheter was successfully removed with gentle and continuous traction, and it was observed that the Foley catheter had knotted within the bladder (Figure 1). No complications were observed in the patient following the removal of the knotted catheter.

Patient informed consent was obtained to publish his information. The patient's private information remained confidential with the researchers.

## DISCUSSION

Urethral catheterization is widely performed in all age group of cases, either temporarily or permanently, for various medical purposes such as collecting urine samples, clean intermittent catheterization, daily urine output monitoring, relieving urinary retention, and voiding cystourethrography. When performed carefully, the complication rate is quite low.<sup>1</sup> The most common complications following urethral catheterization include infection, urothelial trauma, perforation, and creation of false passages. Knotting of the catheter within the bladder is a very rare complication. This condition typically develops due to the use of thin and flexible feeding tubes. The majority of cases reported in the literature are in the pediatric age group.<sup>2-5</sup> It has been reported to occur more frequently in children under the age of two years.<sup>1</sup> Re-

ports of knotted Foley catheters in the bladder of adults are highly limited in the published literature.<sup>6-9</sup> The possible mechanism involves the excessive coiling of a long catheter shaft within the bladder when the bladder volume is reduced, allowing the distal end to pass through an open loop and knot upon applying traction. Smaller diameter and longer length of the catheter may contribute to the increased risk of knotting.<sup>10</sup> Approaches in such cases include gentle and continuous traction, urethral dilation and traction, fluoroscopic manipulation with a guidewire, endoscopic removal, and open or percutaneous cystostomy.<sup>6,9,11-14</sup>

The length of Foley catheters used today are standard and are produced in the same measures for both males and females. This is done to prevent the accidental use of a short catheter in males and inflation of the balloon in the urethra. It is recommended that in male patients, the Foley catheter should be fully inserted, and the balloon should be inflated after urine flow is observed. However, in female patients, due to the shorter urethra, full insertion of the catheter is not necessary. The fact that all reported adult cases are female can be explained by the increased likelihood of the catheter coiling on itself because more of the catheter is inserted into the bladder compared to male patients.

The higher incidence of knotting in the pediatric age group can be attributed to the use of thinner and more flexible catheters, as well as the tendency to overestimate the length of the urethra, especially in male children, leading to further advancement of the catheter into the bladder. The over-insertion of the catheter into the bladder is significant. In newborns, the safe insertion length is recommended to be 6 cm in males and less than 2.5 cm in females.<sup>15</sup>

In conclusion, although urethral catheterization is considered to be a simple and routine procedure, it should be performed with great care, and the catheter should be inserted only as far as necessary to prevent possible knot formation. In pediatric patients, the use of flexible and long feeding tubes should be avoided, and the insertion length of the catheter should be limited according to the patient's age and gender. In adult female patients: Physicians need to remember

that the urethra is shorter than in male patients, and the Foley catheter should not be advanced to its full length. Adequate training and information for the medical staff performing the placement, observation, and removal of these catheters can be helpful in the prevention of such a limited complication.

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*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:** Erhan Erdoğan; **Design:** Erhan Erdoğan; **Control/Supervision:** Erhan Erdoğan; **Data Collection and/or Processing:** Abdullah Aydın; **Analysis and/or Interpretation:** Kemal Sarıca; **Literature Review:** Erhan Erdoğan; **Writing the Article:** Erhan Erdoğan, Kemal Sarıca; **Critical Review:** Kemal Sarıca.

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