

# **Retained Urinary Catheter: An Unusual Presentation Of Massive Encrustation: A Case Report In Aba, South Eastern Nigeria**

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## **Abstract**

*A catheter is said to be retained when the catheter balloon fails to deflate or when encrustation due to the deposit of mineral salts forms around the balloon making it difficult to remove by ordinary maneuver.*

*It is distressing both to the practitioner and the patient.*

*Methods employed in dealing with a retained catheter may leave behind fragments in the urinary bladder which may cause*

- *Recurrent urinary tract infections*
- *Calculus formation*
- *Bladder spasms*
- *Pains*
- *Haematuria*

*The key point in the management of the retained catheter is the avoidance of excessive traction on the catheter which may lead to avoidable urethral injury with subsequent stricture formation.*

*The case presented involved a 35 year old man with spinal cord injury placed on latex foley urethral catheter by the managing hospital.*

*This catheter was carried for 2 months (60 days) without change until the catheter got blocked with subsequent urinary retention.*

*The patient was now referred to our team.*

*All maneuvers employed to remove the retained catheter failed.*

*An ultrasound guided puncture was done on the balloon but a massive encrustation measuring 2.5cm by 2cm was found surrounding the balloon and preventing removal.*

*An open cystostomy was done and the catheter removed abdominally.*

*Fragments detached from the massive encrustation which were erroneously diagnosed as multiple calculi by ultrasound were removed.*

*An insistence on urethral removal would have caused massive trauma to the entire urethra with subsequent long segment stricture formation.*

## **Keywords**

*Retained catheter, Encrustation, Failure of balloon deflation, Open Cystostomy and Aba.*

## I. Introduction

Urinary catheter is said to be retained when there is failure of urethral removal due to

- Failure of deflation of the catheter balloon which it self may be due to valve failure.
- Encrustation as a result of deposit of mineral salts.

Retained pieces or fragments may cause

- Recurrent urinary tract infection
- Nidus for calculus formation
- Bladder spasms
- Pains
- Occasionally haematuria

Retained urinary catheter is distressing both to the patient and the attending practitioner.

The incidence is much higher with latex Foleys catheters than silicon catheters.

It is commoner in poor populations where patients carry urethral catheters for months without change as a result of poor socio-economic conditions.

Various methods have been devised for managing retained catheters but they may carry some risk of urethral injury.

The various methods include

- Non invasive methods
- Minimally invasive methods
- Endoscopic methods
- Open removal

The non invasive methods have the greatest risk of urethral injury. They include the following

- Cutting of the balloon part proximal to the inflation valve.
- Hyper inflation techniques which entail continous fluid inflation until the balloon bursts. It carries the risk of leaving fragments behind in the bladder.
- Instillation of mineral solutions to dissolve the balloon. This has the risk of inflammatory reaction on the urethral wall.
- Use of needle puncture to puncture the balloon through the abdominal, perineal and rectal routes.

The minimal invasive methods include

- The use of guide wires or stylet to puncture the balloon.
- The use of ultrasound guided balloon puncture.

The endoscopic method involves the use of cystoscopy.

The open removal is employed as a last resort when other methods have failed or when there is massive encrustation as in this index case.

In most cases of retained catheter, the patients have had no formal counselling on the management of their catheters and the attendant risks involved.

## II. Case Presentation

A 35 year old man was rushed to the emergency room with history of retained catheter.

The patient had had a spinal cord injury with severe paraparesis and difficulty with emptying of the bladder.

He was managed in a Neurosurgical center when urethra catheter was placed.

Patient had been allowed home and made no attempt in two months to change the catheter until it was blocked with subsequent urinary retention prompting his referral to us.

Non invasive techniques were employed in removal of the catheter but all failed.

Ultrasound guided puncture was done but catheter could not be removed but the diagnosis of massive encrustation with multiple bladder calculi was made.

Decision for open cystostomy was made and the catheter was removed abdominally.

A massive encrustation 2.5cm by 2cm covering the entire balloon with multiple fragments was seen.

A 16 F silicon catheter was replaced urethrally.

Patient did well and was discharged home

Figure 1



The arrow above shows the encrustation forming a cap over the balloon of the catheter. The fragments of the encrustation were erroneously diagnosed as calculi.

Figure 2



A clearer view of the Encrustation

### **III. Discussion**

The management of retained urethral catheter is often distressing to the patient and the practitioner. The causes of retained urethral catheter include

- Failure of balloon deflation
- Encrustation
- Debris in the urine
- Over inflation of the balloon
- Entrapment of catheter balloon by blood clots.
- Bladder spasms
- Incorrect removal techniques

Out of these, encrustation and failure of balloon deflation remain the two most common causes.

Catheter encrustation occurs when urease producing bacteria such as proteus mirabilis colonize the catheter creating a biofilm that breaks down urea into ammonia and water creating an alkaline environment.

With alkaline urine, struvite and calcium phosphate crystallize out to leave deposits on the surface of the catheter.

Biofilm formation is accelerated by high PH, long term catheterization and dehydration.

The biofilm acts as a matrix unto which the crystals adhere.

Dehydration creates a concentrated urine increasing the saturation of minerals in the urine such as calcium and magnesium.

On the other hand, failure of balloon deflation is primarily due to the obstruction of the deflation valve due to

- Crystals
- Faulty valve mechanisms
- Encrustation
- Balloon trapping by bladder spasms
- Physical damage to the inflation valve
- Severe kinking of the catheter

Latex catheters are more prone to deflation failure and encrustation than silicon catheters.

DJ stickler et al on their work on encrustation and blockage of long term indwelling catheters, found out that there is a strong experimental evidence that infection by proteus mirabilis is the main cause of crystalline biofilms that encrust and block foley catheters.

The ability of the bacteria to colonize all available types of indwelling catheters allows it to take up stable residence in the catheterized tract causing recurrent catheter blockage.

They concluded that the elimination of P-mirabilis with antibiotic therapy improves the quality of life.

For patients who are already blockers and stone formers, antibiotic therapy is unlikely to be effective due to the resistance by the biofilms.

Sanket Kalpande et al in their work on the study of factors influencing the encrustation of catheters found out that encrustation was more common in bedridden patients compared to physically active patients and also more common in those with single catheter more than 15 days.

They concluded that the following factors influence encrustation

- Infection with urea splitting organisms
- Alkaline PH of the urine
- Poor physical activity of patient
- Duration of catheterization

In our index case, he had low physical activity being severely paraparetic moving with working aids.

Catheter specimen of urine culture yielded a significant growth of staphylococcus aureus and he had indwelling catheter for two months, all these factors influencing the massive encrustation.

Tiko Ram Bhandarl et al in their work on massive encrustation as a consequence of long term indwelling urethral catheter concluded that, catheterization under aseptic conditions, frequent catheter change, early treatment of infections and proper patient education on catheter hygiene are few methods that can reduce the complications of long term catheterization.

Surgical removal is the only option for massive encrustation.

In our index case, he had a massive encrustation and was removed through open cystostomy.

#### **IV. Conclusion**

Catheter encrustation and failure of balloon deflation appear to be the most common causes of retained urethral catheters.

For those on long term catheterization, patient education on catheter hygiene and frequent catheter change are mandatory.

Early detection of infection and aggressive treatment are necessary for the prevention of the occurrence of retained catheters.

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