Calyceal Diverticulum with Calculi: Management Strategies

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Objectives

• Compare and discuss use of antegrade and retrograde approaches for stone management

• Analyze the physical factors of calyceal stones and employ the approach indicated for optimal stone management

• *I do not have any relevant financial interests to disclose*
Calyceal Diverticulum

- Smooth walled, non-secretory cavities within the renal parenchyma
- Lined with transitional cell epithelium
- Receive urine by passive retrograde filling from adjacent collecting system, usually through a narrow infundibulum
Calyceal Diverticulum

- Believed to be congenital in origin
- Found in 0.21% to 0.45% of IVPs
- Majority is less than 1 cm in diameter
- Is equal by gender and side
- Bilateral in 3% of cases

Calyceal Diverticulum

- Uncomplicated, asymptomatic cases may be managed conservatively without routine follow-up imaging

- Urine stasis may predispose to infection and calculus formation
Calyceal Diverticulum

Indications for treatment include:

• Pain
• Infection
• Calculi
• Hematuria
• Compressing contiguous calyx or parenchyma
Calyceal Diverticulum

- Calculi are concomitant in 9.5%-39% of cases, and rarely pass spontaneously

- Recurrent infections are attributable to 25% of cases

Calyceal Diverticulum

Location:

• Upper calyx 70%
• Lower 18%
• Mid 12%
Calyceal Diverticulum

Obstruction of the diverticular neck may lead to:

- Sepsis
- Abscess formation
- Hypertension

Calyceal Diverticulum

Treatment Options:

Open surgical is largely replaced by:

- Partial nephrectomy or ablation (laparoscopic or robotic)
- PCNL (removal of calculi) & ablation of the cavity
- Ureteroscopic management (RIRS)
Calyceal Diverticulum

Treatment Options:

• ESWL is not recommended since passage of the stone fragments may be difficult.

Problem is not solved
ESWL may be considered for symptomatic diverticulum containing calculi with a large infundibulum.
Calyceal Diverticulum

Treatment option: percutaneous

- Infundibuloplasty with balloon dilation between the diverticulum and the collecting system was recommended with stenting across the spaces

Extraction
Cautery
Calyceal Diverticulum

Combination Treatment (ESWL and ureteroscopy)

• 75% rendered stone-free with ESWL and ureteroscopy
  (23% required repeat procedures)

Calyceal Diverticulum

Ureteroscopy:

Challenges include:

• Identification of the diverticular neck
• Remove calculi / ablation

There is still no consensus on obliteration of the diverticular cavity.

Treatment limitations exist for anteriorly located diverticulum. This can be approached using flexible ureteroscopy.
Calyceal Diverticulum

Ureteroscopy:

• The flexible is preferred because of the location of these diverticulum.

• Stone-free status is relatively low.

• Difficulty in location diverticular neck, especially in the lower pole.

Batter, Auge
Calyceal Diverticulum

Treatment Options:

- Transperitoneal laparoscopic marsupialization and fulguration

Calyceal Diverticulum

Laparoscopic Management

- Ideal when thin parenchyma overlies the diverticulum.
- Laparoscopic ultrasound can identify the calculi.
- The lining can be ablated with laparoscopic argon beam coagulators.
- Placement of nephrostomy tube not possible; drain placed.
- Failed PCNL may be a relative contraindication to the laparoscopic approach due to perirenal adhesions.
Calyceal Diverticulum

Complications:

- Hemorrhage
- Pneumothorax
- Urinary extravasation
- Renal pelvis perforation
- Urinoma
Calyceal Diverticulum

Conclusion:

- PCNL, with ablation of the cavity
- Ureteroscopy
- Laparoscopy and robotics

- are utilized to treat patients with symptomatic calyceal diverticulum.
Calyceal diverticulum Canales and Monga