

경피적 신루설치술 적응증 및 관리

대구가톨릭대학교 의과대학
비뇨의학과
정현진

경피적 신루설치술

- 경피적 신루설치술 (percutaneous nephrostomy, PCN)
- 투시, 초음파 혹은 CT 등의 영상 유도하에 피부와 신실질을 경유하여 신배 (renal calyx)를 무균적으로 천차한 후, 유도 철사 도관을 이용하여 카테터를 신우 (renal pelvis) 내에 삽입하는 치료술



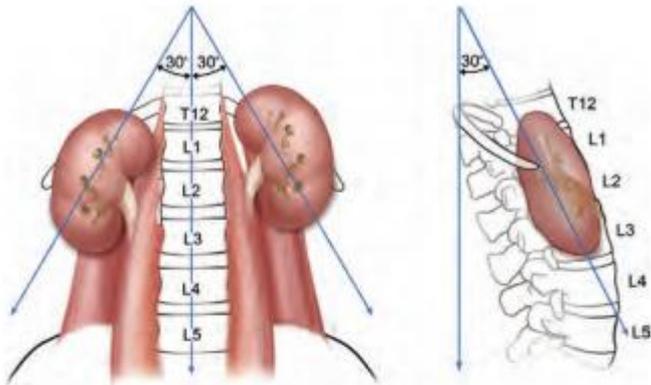


Fig. 12.1. Location of kidneys in the retroperitoneum.

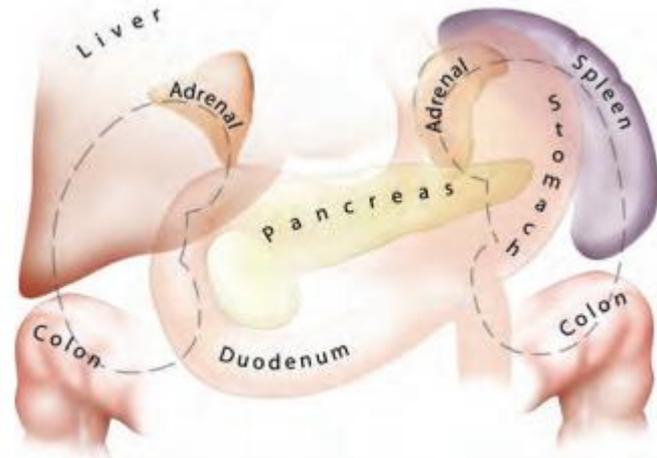


Fig. 12.3. Viscera lateral, anterior, and medial to the kidneys.

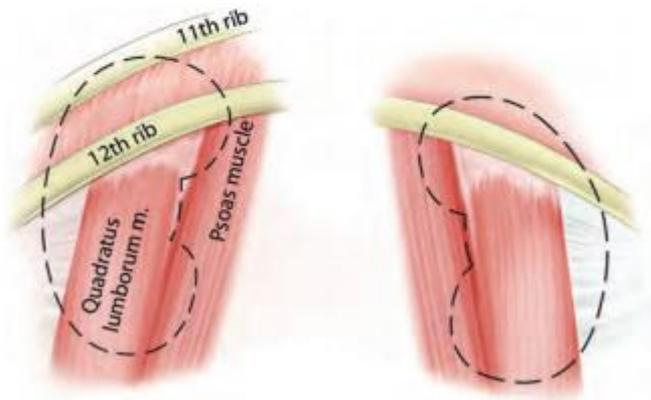


Fig. 12.2. Muscles and ribs posterior to the kidneys.

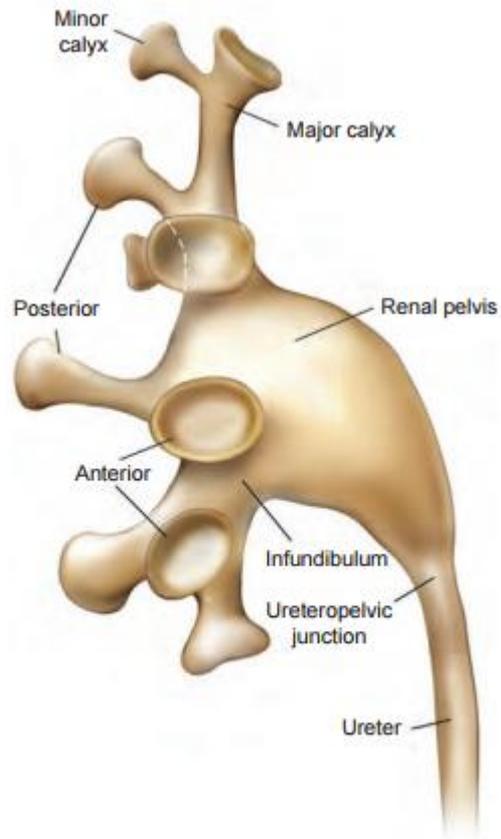


Fig. 12.4. Upper urinary tract collecting system.

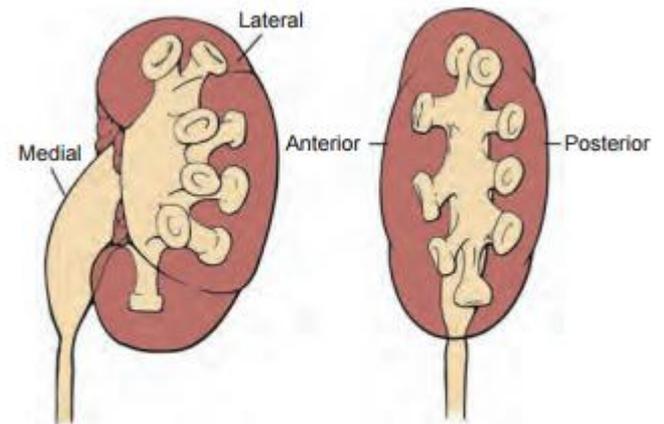


Fig. 12.5. Calyceal orientation of polar and middle calyces. (From Smith AD: *Controversies in endourology*. Philadelphia, 1995, Saunders.)

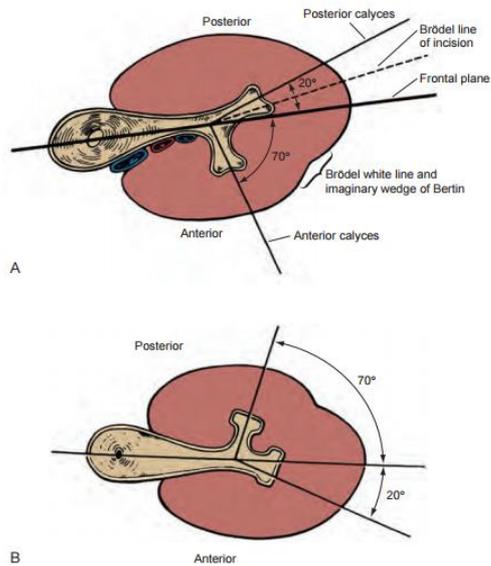


Fig. 12.6. Relation of anterior and posterior calyces to renal parenchyma in Brödel-type kidney (A) and Hodson-type kidney (B). The optimal site of percutaneous entry from the posterior aspect of the kidney is into a posterior calyx because the path into the renal pelvis is fairly straight. If entry is into an anterior calyx (from the posterior aspect of the kidney), then an acute angulation must be made to enter the renal pelvis, which may not be possible with rigid instrumentation. (From Smith AD: *Controversies in endourology*. Philadelphia, 1995, Saunders.)

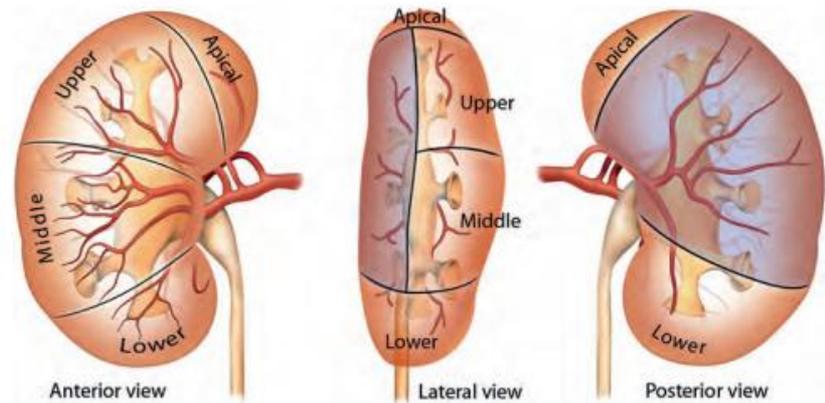


Fig. 12.7. Arterial supply to the kidney. The kidney is supplied by the anterior and posterior branches of the main renal artery. The anterior branch supplies both the anterior half of the kidney and the polar regions via four segmental branches. The posterior branch of the renal artery supplies the posterior aspect of the kidney (represented by the shaded region). An avascular plane, known as the Brödel line, separates the anterior and posterior circulations.

적응증

Urinary obstruction (m/c)

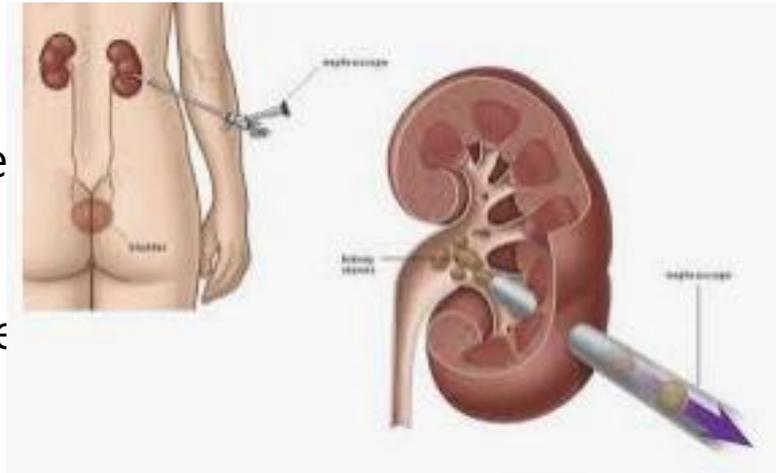
Benign (eg, ureter stone)
or malignant etiology (e

Urinary diversion

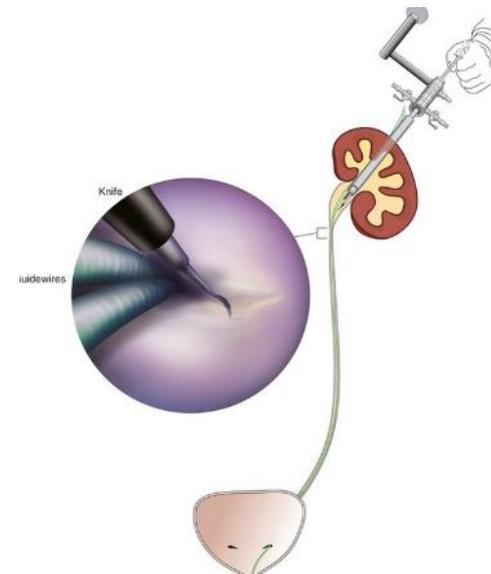
Traumatic or iatrogenic ure
Urinary fistula
Hemorrhagic cystitis

Access for endourologic procedures

Percutaneous nephrolithotomy
Dilation or stenting for ureteral stricture
Ureteral occlusion for urinary fistula
Biopsy of a urothelial lesion
Endopyelotomy



ervical tumor)

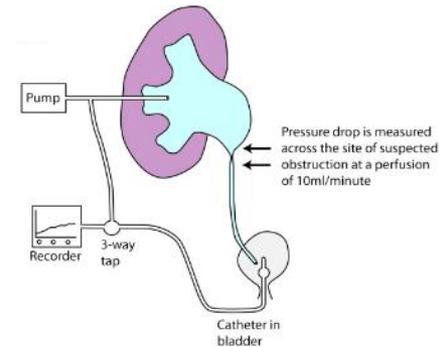


적응증

Diagnostic method

Antegrade pyelography (AGP)

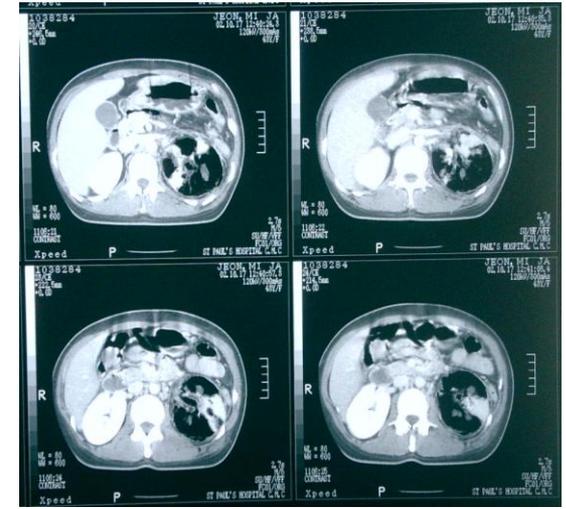
Ureteral perfusion (eg, Whitaker test)



Emergency PCN

Pyelonephrosis (eg. emphysematous pyelonephritis)

Acute renal failure secondary to obstructive uropathy
(hyperkalemia)



금기증

Absolute

International Normalized Ratio > 1.5

Platelet < 50,000/cm³

Relative

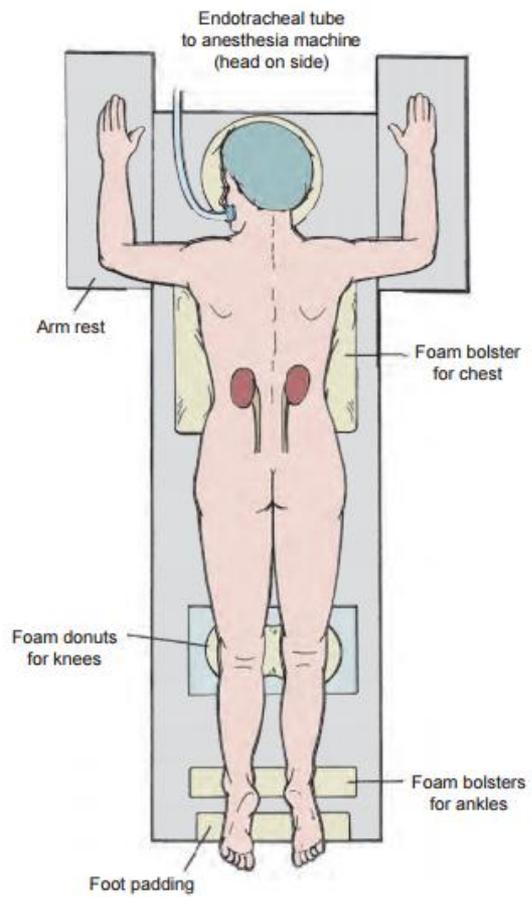
Severe hyperkalemia or other metabolic imbalance

Uncontrolled hypertension

Percutaneous approach to kidney that crosses colon, spleen, or liver

시술 전 준비사항

- 금식 (4시간 가량)
- 혈액검사 (일반혈액검사, 혈액응고검사 포함)
- 영상검사 (초음파, CT, X-ray 등)
- 동의서
 - 시술의 이유,
 - 진정제 및 마취제의 사용,
 - 시술 시 발생 가능한 합병증 (출혈, 통증, 감염, 요누출, 패혈증, 사망 가능성 등)이 포함



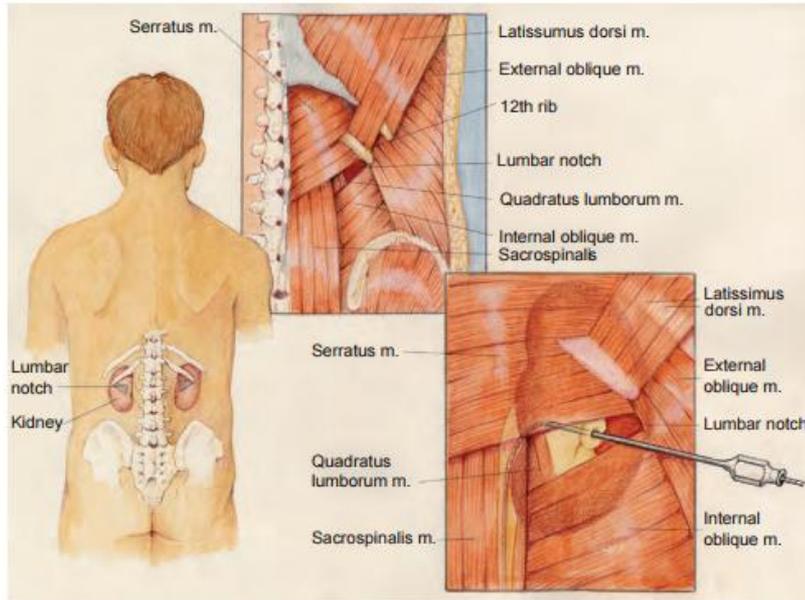


Fig. 12.17. The lumbar notch is a useful anatomic landmark for blind percutaneous access to the renal collecting system. It is bounded superiorly by the latissimus dorsi muscle and the 12th rib, medially by the sacrospinalis and quadratus lumborum muscles, laterally by the transversus abdominis and external oblique muscles, and inferiorly by the internal oblique muscle.

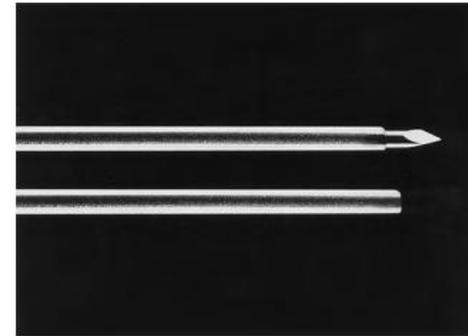
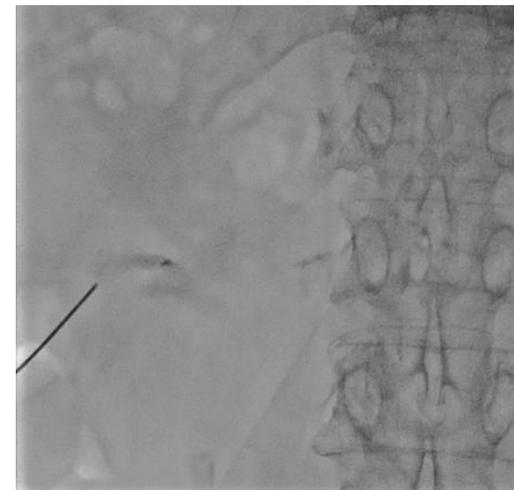
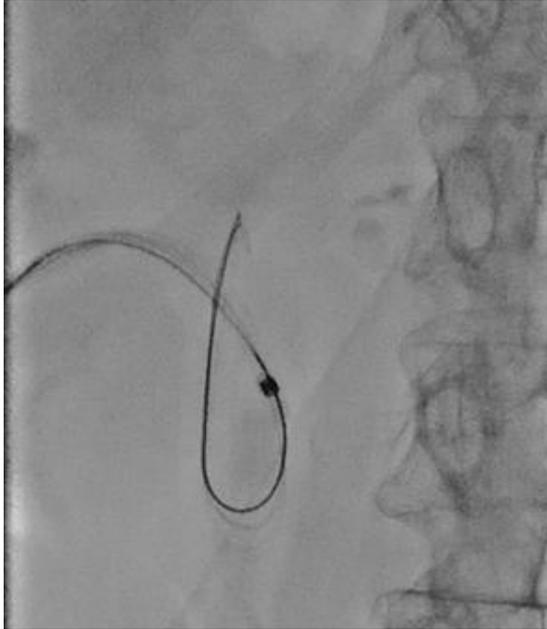


Fig. 12.18. Percutaneous access needle, with a blunt sheath and a sharp obturator.





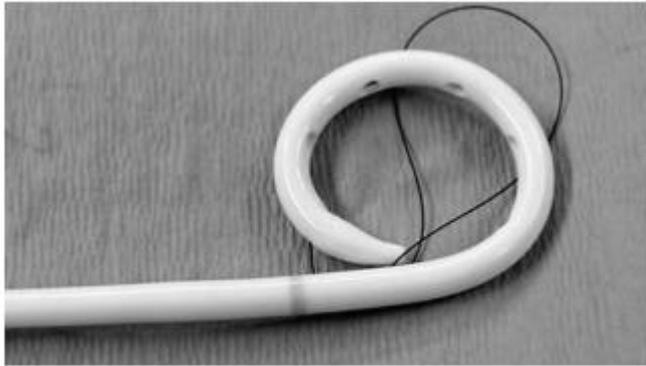


Fig. 12.24. Cope catheter with the retention string loosened for demonstration.

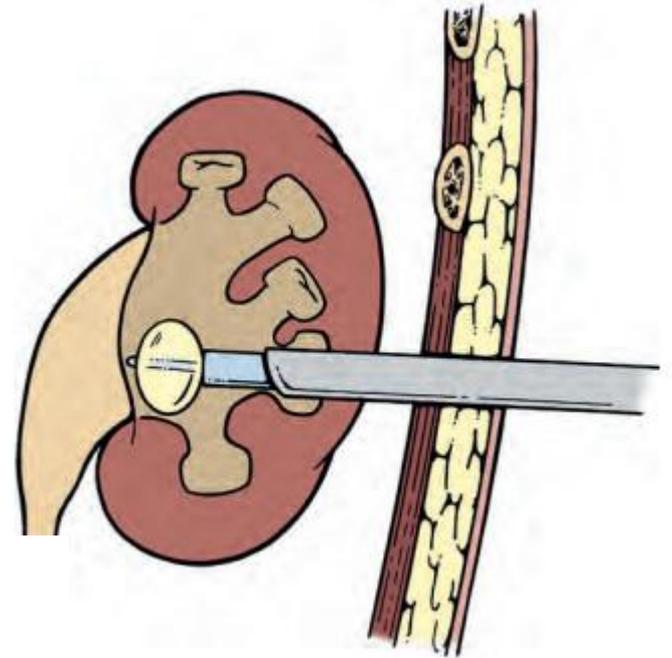


Fig. 12.23. Council catheter.

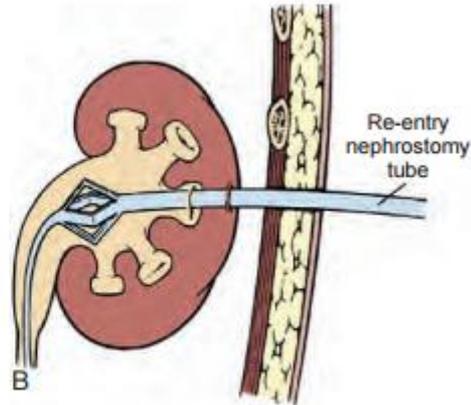


Fig. 12.25. (A) Malecot catheter. (B) Malecot catheter with ureteral extension ("re-entry" catheter).

합병증

- 출혈 (급성출혈, 지연출혈)
- 집합계 손상
- 복강내 장기 손상
- 흉강손상
- 감염

합병증

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급성출혈

- PCN 후 수혈이 필요할 경우 : 0.5-4%
- PNL 후 수혈이 필요한 경우 : 0.8-20%

- Risk factor
 - Patient characteristics
 - Multiple access site
 - Supracostal access
 - Increasing tract size
 - Tract dilation with methods other than balloon dilation
 - Prolonged operative time
 - Renal pelvic perforation

급성출혈

- 시술 후 vital sign 을 주의깊게 관찰
- Lab f/u
- Urine color 확인
- Renal parenchyma

지연출혈

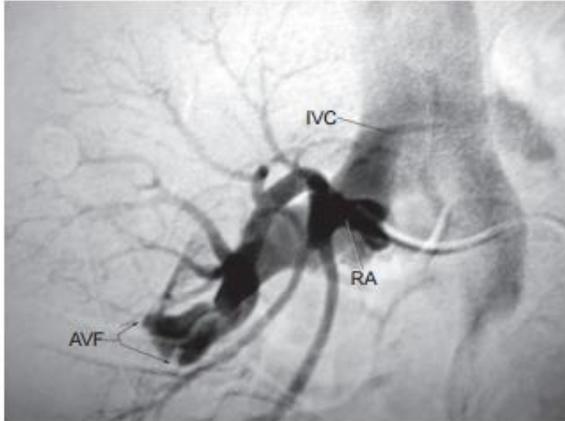


Fig. 12.32. Angiography of the renal artery (RA) is followed promptly by contrast material appearing in the inferior vena cava (presence of an arteriovenous fistula (AVF)).

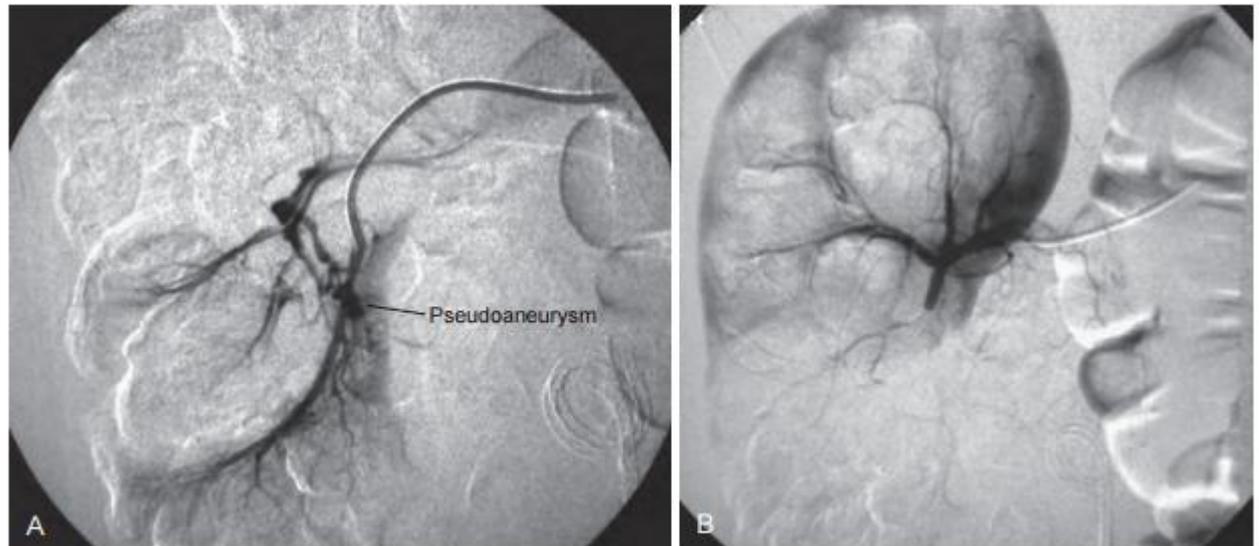


Fig. 12.33. (A) Angiography demonstrates a pseudoaneurysm in the lower pole of the right kidney. (B) Angioembolization was successful at occluding the pseudoaneurysm, but it also devascularized a large portion of the lower pole.

합병증

- 출혈 (급성출혈, 지연출혈)
- 집합계 손상 (요누출)
- 복강내 장기 손상
- 흉강손상
- 감염

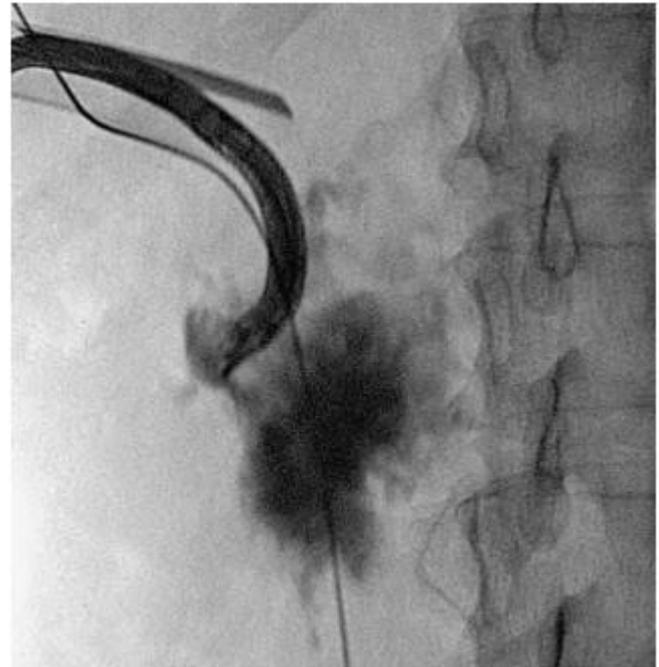


Fig. 12.34. Renal pelvic perforation confirmed with injection of contrast material through flexible nephroscope.

합병증

- 출혈 (급성출혈, 지연출혈)
- 집합계 손상
- 복강내 장기 손상
- 흉강손상
- 감염

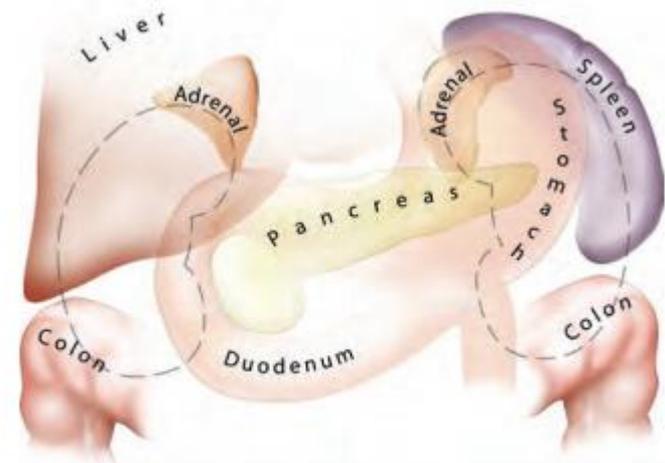
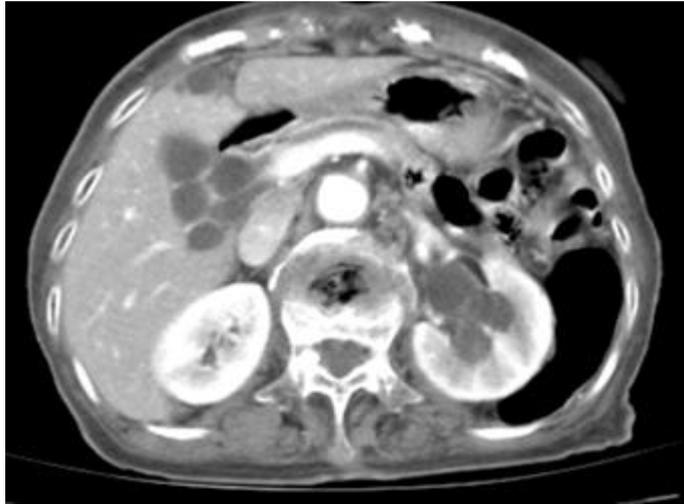
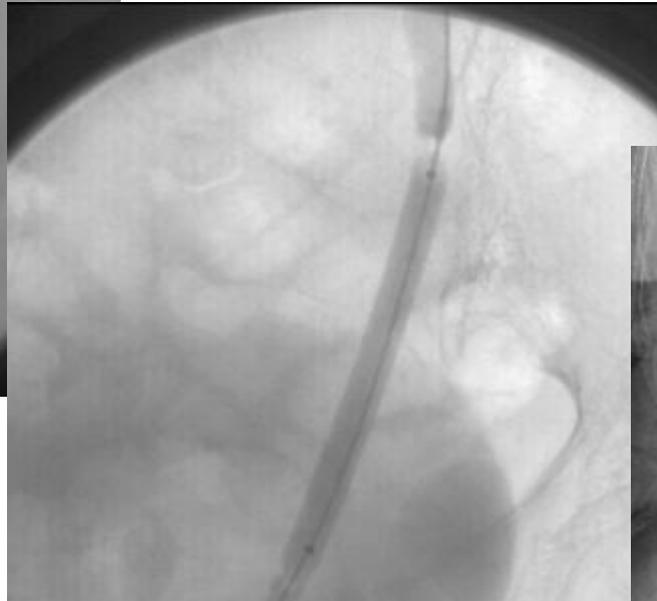
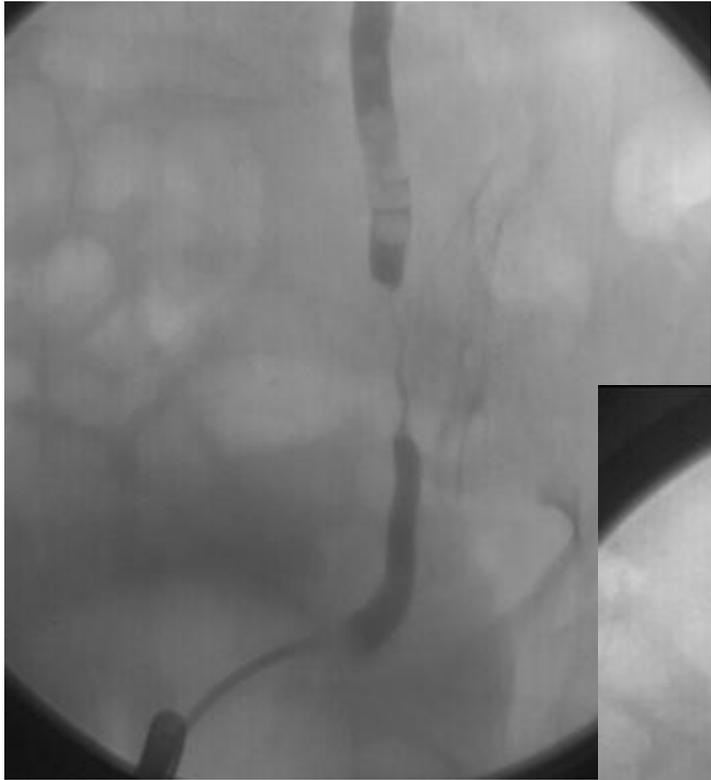
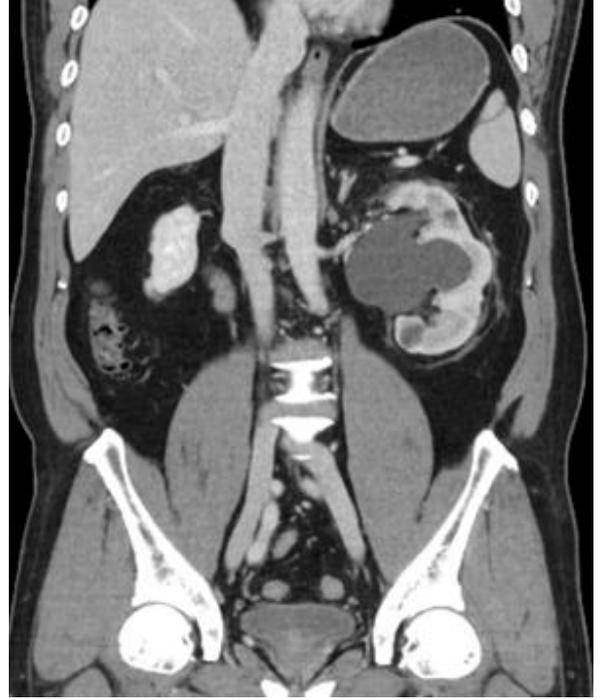
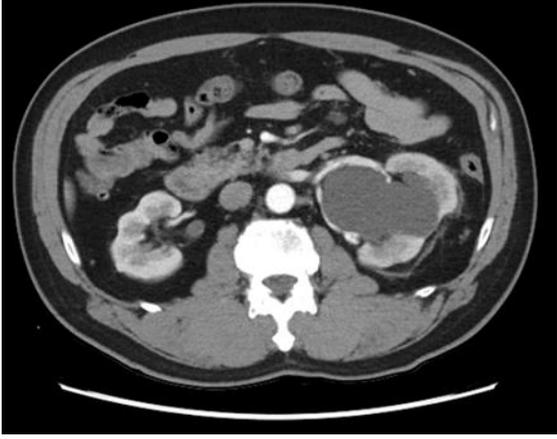
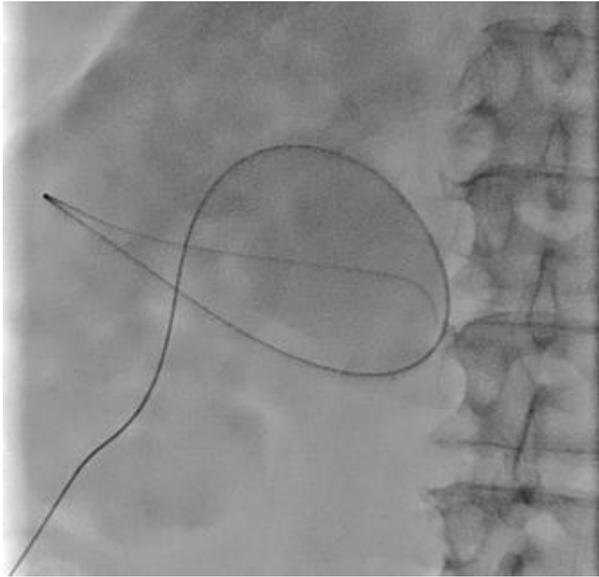
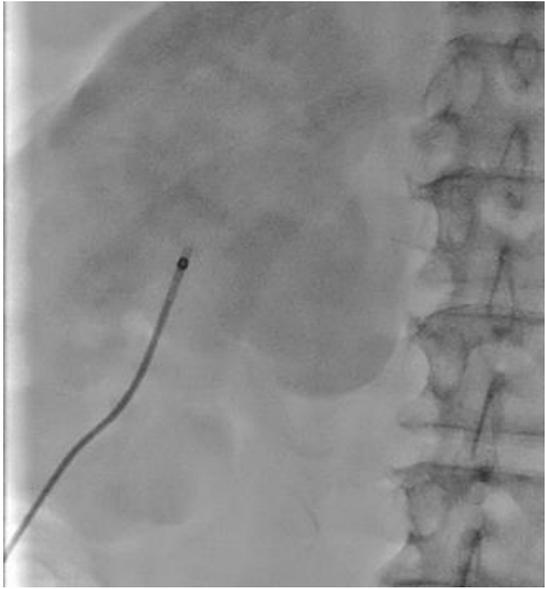


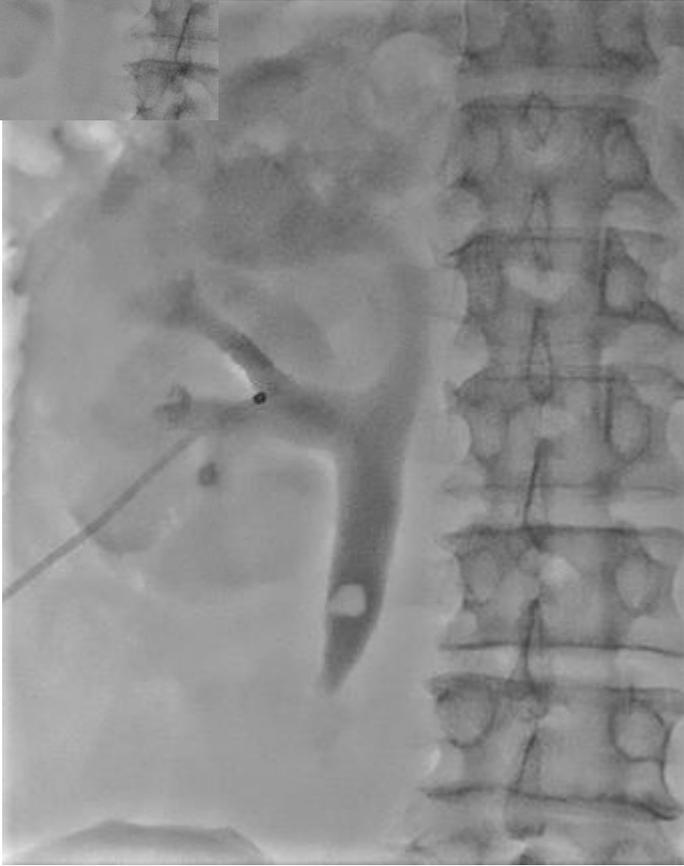
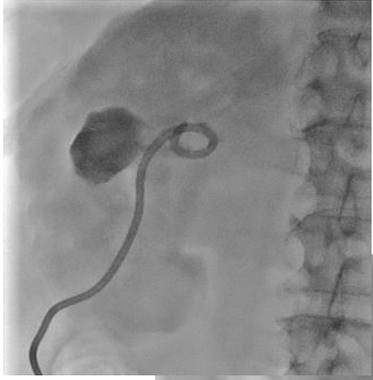
Fig. 12.3. Viscera lateral, anterior, and medial to the kidneys.











합병증

- 출혈 (급성출혈, 지연출혈)
- 집합계 손상
- 복강내 장기 손상
- **흉강손상**
- 감염

흉강손상

- percutaneous access to the upper urinary tract – collecting system,
- supracostal access

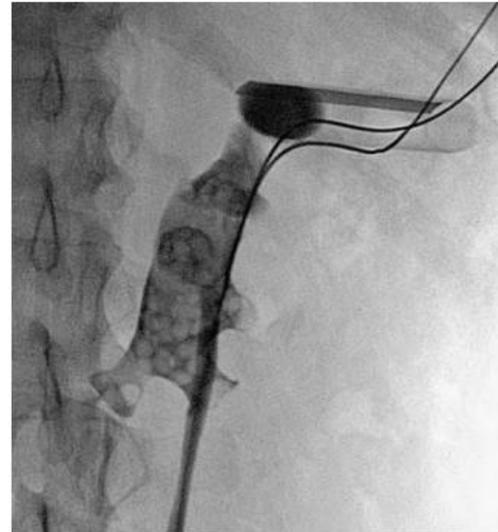


Fig. 12.30. Percutaneous access sheath (radiolucent except for a radiopaque stripe) in upper pole of horseshoe kidney. Note medially directed lower pole calyx. Although not apparent from this radiograph, the access site is subcostal.

합병증

- 출혈 (급성출혈, 지연출혈)
- 집합계 손상
- 복강내 장기 손상
- 흉강손상
- 감염

감염

- fever 15-30%
- Sepsis 0.5-2.5%
- Prophylactic antibiotics

카테터 관리

- 몸 밖으로 노출되어 있는 배액 catheter가 빠지지 않도록 주의해야 한다
- 감염방지를 위해 배액 catheter와 그 주위를 규칙적으로 소독해야 한다 (2-3일에 한번)
- 배액 catheter는 3-4개월 간격으로 교환해야 하며, 그 기간 내에 문제가 있으면 (막히거나 빠지거나) 즉시 담당 주치의와 상의해야 한다



요약

- PCN 적응증 : urinary obstruction (m/c)
- PCN 금기증 : 출혈성 경향
- PCN 합병증
 - 출혈
 - 손상
 - 감염
- PCN 관리
 - 카테터 빠지지 않도록 주의
 - 염증 생기지 않도록 주기적 소독
 - 3-4개월 간격으로 교체

감사합니다