

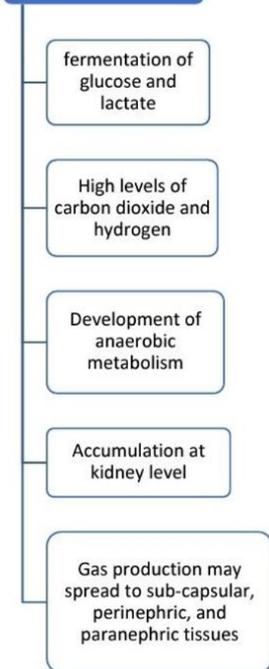
CONCEPT

Emphysematous pyelonephritis (EPN) is a necrotizing infection of the kidney and the surrounding tissues characterized by the formation of gas in the affected tissues. **Median Age: 57 years. Male: Female Ratio 1:2.5**

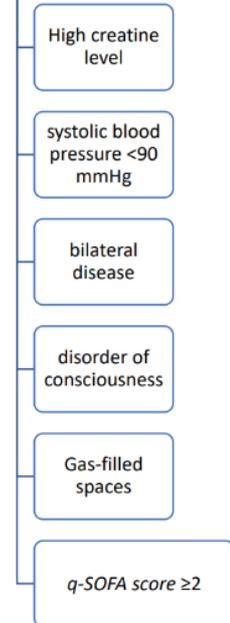
AETIOLOGY	RISK FACTORS	CLINICAL PRESENTATION
Gas-Forming bacteria <i>Escherichia coli</i> (most common ≈70%) <i>Klebsiella pneumoniae</i> (19%) <i>Proteus mirabilis</i> (7%) <i>Pseudomonas aeruginosa</i> (6%)	Diabetes mellitus (70-90%) Obesity Upper urinary tract obstruction Neurogenic dysfunction Chronic alcoholism, drug abuse Immunocompromised	Pyuria and pneumaturia (78%) Flank pain (68%) Fever (60%) Hematuria (29%) Altered consciousness (30%) Shock (25%)

PATHOGENESIS

Gas production



Predictors of mortality



MANAGEMENT & PROGNOSIS:

Rules of conservative management (FANNS)

Fluid Resuscitation/intravenous Antibiotics /wide bore Nephrostomy or JJ drainage / ICU management of Septic Shock/ Emergency Nephrectomy

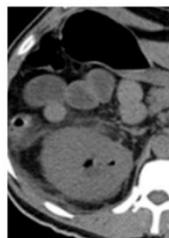
23 risk factors have been associated with prognosis (prognostic score system proposed by *Krishnamoorthy S et al.*)

Type I EPN, bilateral EPN, concomitant thrombocytopenia and conservative treatment without adequate drainage are associated with increased mortality of patients with this devastating infection.

MORTALITY RATE:

Normal kidneys : 11-42%
Transplant kidneys: 13-22.5%
Bilateral EPN: 5-50%

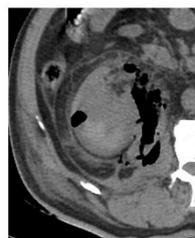
CLASSIFICATION: Huang and Tseng, 2000



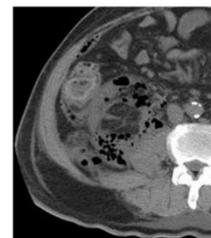
Class I



Class II



Class IIIA



Class IIIB



Class IV

CLASSIFICATION	YEAR	EPN CLASSIFICATION	EXAM
Langston and Pfister	1970	-Diffuse mottling of the renal parenchyma -Bubbly renal parenchyma surrounded by crescent-shaped gas in the perinephric space -Extension of gas through the Gerota fascia	X ray and pyelogram
Michaeli	1984	Stage I - Gas within the renal parenchyma or the perinephric tissue Stage II - Presence of gas in the kidney and its surroundings Stage III - Extension of gas through Gerota's fascia or bilateral EPN	X-Ray IVP
Wan	1996	Type I - parenchymal destruction, with streaky or mottled parenchymal gas and absence of fluid collection Type II - renal or perirenal fluid collection, with bubbly gas collection in the perinephric space or collecting system	Plain radiography, computed tomography, ultrasonography
Huang and Tseng	2000	Class 1 - Gas confined to the collecting system Class 2 - Gas confined to the renal parenchyma alone Class 3A - Perinephric extension of gas or abscess Class 3B - Extension of gas beyond the Gerota fascia Class 4 - Bilateral EPN or EPN in a solitary kidney	CT and Ultrasound
Al-Geizawi	2010	Stage 1: Gas in the collecting system Stage 2: Gas replacing <50% of renal parenchyma, with minimum spread to the surrounding tissues; Sepsis rapidly controlled Stage 3: Gas replacing >50% of renal parenchyma; or Extensive spread of infection in the perinephric area; or Patient with evidence of multiple organ failure, uncontrolled sepsis, or shock not responding to medical management	Ultrasound + CT