Experience of percutaneous renal biopsy in patients with advanced airway management and acute kidney injury at Hospital Juarez de Mexico

Yuridia Velázquez Santiago[1], Edgar Misael Pérez Jiménez[1], Francisco Gabriel Salgado González[1], José Eduardo Ruiz Aguilar [1], Octavio Rene García Flores[1], Enzo Christopher Vásquez Jiménez[1]

Nephrology Department, Hospital Juarez de Mexico[1]

WCN24-AB-2682

Introduction

Kidney biopsy is an invasive study that is the gold standard for diagnosis, stratification and prognosis of kidney diseases. It should be indicated depending on the clinical status and the careful balance between risks and benefits in each patient.
In critically ill patients with mechanical ventilation, it is common to find impairment in kidney function due to multiple mechanisms such as hemodynamic compromise, activation of neuroendocrine pathways, the release of proinflammatory mediators and exposure to nephrotoxic agents.
The KDIGO guideline for AKI recommends performing kidney biopsy if the cause of AKI is unclear after careful evaluation, especially in patients without prerenal or postrenal causes.
Even with medical indications, it is rarely performed in critically ill patients due to their clinical conditions.

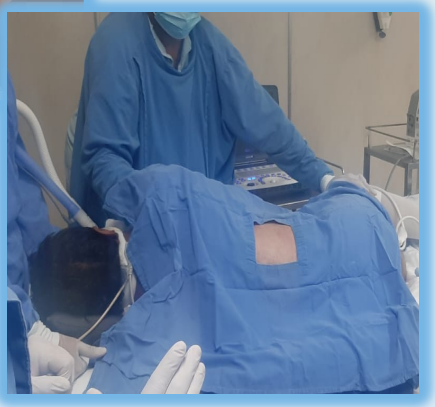
Objective

We report the cases of three critically ill patients with mechanical ventilation, kidney biopsy was performed through a right lateral decubitus approach.

Methods y Results

Three biopsies were performed on patients under mechanical ventilation and deep sedation, with vasopressor use and biochemical abnormalities such as anemia, thrombocytopenia, and elevated azotemia. Among the three patients (2 females, including one pregnant, and 1 male) with an average age of 26 years, all experienced acute deterioration of renal function. Left supine anterolateral position was used because it allowed adequate mobilization without interfering with monitoring and mechanical ventilation.
The ipsilateral arm was placed on the chest and the contralateral arm placed in abduction. The ipsilateral leg was flexed at 45° and the contralateral leg was extended so that its lateral side was on the table. This position provides complete exposure of Petit's triangle (latissimus dorsi muscle, lower border of the twelfth rib, iliac crest) allowing easy ultrasound-guided puncture of the lower pole of the right kidney, a safe path in which no other organ such as the liver or colon is found between the skin and kidney. An ultrasound guided percutaneous biopsy of the right kidney was taken using a 16-gauge automatic biopsy gun, 2 passes were performed to obtain two cylinders of kidney tissue. Biopsies were performed by two experienced nephrologists.
The following table describes the main clinical, biochemical and histopathological data of the 3 patients.

Patient	Age	Gender	Basal Creatinine	Biopsy Indication	Hemoglobin	Platelets	INR	Anticoagulation	BUN	Pre-Biopsy RRT	Complicatios	Biopsy Position	Death by Other Cause	Histopathological Findings
1	24 years	M	0.61	Nephrotic Syndrome	8.9	66 x10^3	1.1	Yes	32	Plasmapheresis	No	Leftt Lateral Decubitus	Yes	Membranous nephropathy
2	59 years	F	0.7	Rapidly Progressive Glomerulonephritis	10.3	114 x 10^3	1.18	Yes	46	Hemodyalisis and Plasmapheresis	Hematoma	Prone	Yes	Pauci-immune gimerulonephritis
3	29 years	F	3.6	Acute kidney Injury	7.1	117x10^3	1.1	No	57	Continuos Kidney Reemplacement theraphy	No	Left Lateral Decubitus	Yes	Tubulointerstitial nephritis



Discussion

The lateral position for biopsy in ventilated patients demonstrated a surprisingly high diagnostic yield and no complications in critical patients. None of our patients suffered procedure-related consequences. Our data may encourage other providers not to shy away from indicated renal biopsies, even in intubated patients.
Although the number of cases in our center is limited, the technique will continue to be implemented due to its high diagnostic yield and impact on patient prognosis based on renal biopsy information.

Bibliography

Sawicka K, Hassan N, Dumaine C, Budd A, Wall C, Banerjee T, Lim HJ, Mondal P, Barton J, Moser MAJ. Direction of the Biopsy Needle in Ultrasound-Guided Renal Biopsy Impacts Specimen Adequacy and Risk of Bleeding. Can Assoc Radiol J. 2019 Nov;70(4):361-366. doi: 10.1016/j.carj.2018.11.006. Epub 2019 Mar 27. PMID: 30928202.
Visconti L, Cernaro V, Ricciardi CA, et al. Renal biopsy: still a landmark for the nephrologist. World J Nephrol 2017;5:321.