



LETTER TO THE EDITOR

Transvascular kidney biopsy in adolescent patients—safe alternative to open procedures

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Kidney biopsy is a main useful diagnostic procedure in nephrology [1]. In cases where percutaneous renal biopsies (PRBs) cannot be performed, only open kidney biopsy was frequently applied in the past [2]. In 1990, the interventional–radiological technique of transvascular liver biopsy was adapted for transvascular renal biopsies (TRBs) [3]. As an access site for native kidneys, the right jugular vein is usually chosen, whereas renal transplant biopsies are performed via a transfemoral approach [4].

We report on five cases of 14- to 17-year-old adolescents who underwent TRB after PRB had failed because of massive obesity, very small kidneys or an extreme fibrotic renal capsule after transplantation. The clinical indications for these kidney biopsies included significant creatinine increases in two transplanted patients, significant proteinuria in one patient with lupus nephritis, newly diagnosed unclear end-stage renal failure in one patient and unexplained gross proteinuria in a patient with reflux nephropathy.

We used the same renal access and biopsy set containing a 19-gauge biopsy needle and a 14-gauge guiding cannula in all cases for transjugular (Figure 1A–C) or transfemoral access (Figure 2A–C) [4]. The recommended amount of at least 10

glomeruli could only be achieved in one transjugular (15 glomeruli) and one transfemoral biopsy (20 glomeruli). The median number of glomeruli was 6, with a range of 5–20 glomeruli. The mean number of glomeruli was 10.4. In all cases, diagnostically conclusive histological findings could be obtained. Minor or major complications during or after TRB were reported in none of the patients.

The Banff Foundation for Allograft Pathology recommends 10 glomeruli and a threshold for a minimal sample of 7 glomeruli per kidney biopsy procedure for an adequate assessment [5]. Even though this was reached in only two patients, the renal pathologist was able to assess the biopsy specimens adequately. Thus it was possible to avoid further biopsy attempts.

TRB is an alternative to PRB after PRB has failed or in cases with a higher risk of complications [6]. The main advantage of TRB may be a lower risk of capsular perforation or severe blood loss during the procedure [6]. TRB may be a suitable and safer alternative in patients with bleeding disorders or severe hypertension, as well as in patients on anticoagulant therapy [7]. Nevertheless, in all cases, an individual assessment has to be performed. Exclusion criteria for TRB include thrombosis and

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allergic reactions to contrast media [8]. Although TRB proved itself safer than PRB, especially in patients with severe clotting disorders, complications may occur. The median rate for severe complications differs widely in the current literature. The most common complications are small perirenal or subcapsular haematomas with no therapy needed [8, 9]. Gross macroscopic

haematuria was observed in 2.7–7% of cases [6, 10]. Further possible complications during and after TRB include arteriovenous fistulas, longer-lasting pain, allergic response to the contrast medium and infections [6].

Although it is unlikely to be established as a routine method due to limited trained personnel, prohibitive costs and time



FIGURE 1: Transjugular kidney biopsy. (A) Selective catheterization of a segmental vein of the lower pole of the right kidney. (B) Positioning of the stiffening cannula within the lower pole vein. (C) Optimal position before advancing the inner core of the biopsy needle towards the renal cortex (dotted line leads into target biopsy region).



FIGURE 2: Transfemoral kidney biopsy. (A) Selective catheterization of a segmental vein of the upper pole of a renal transplant within the left iliac fossa. (B) Positioning of the stiffening cannula. (C) Biopsy from the cortex of the allograft.

constraints, TRB can be recommended as a safe and highly diagnostic method for obtaining renal tissue in cases of impossible PRB. The comparatively low rate of complications both in adults and adolescents confirms this finding.

In conclusion, kidney biopsy both via transjugular and transfemoral access was safely feasible in adolescents. Even if an adequate renal pathology assessment was possible, the marginal number of obtained glomeruli limits the strength of this study. Online histological evaluation of the specimen could offer the possibility to adapt the number of specimens and glomeruli to ensure adequate tissue sampling in the majority of cases [4].

CONFLICT OF INTEREST STATEMENT

None declared.

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