

Post-Transplant Kidney Biopsy: A Study of 50 Consecutive Cases at a Tertiary Care Center

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Introduction

Renal allograft dysfunction remains a critical complication post-kidney transplantation, necessitating timely evaluation through allograft biopsy. Indications range from delayed graft function (DGF) and rising serum creatinine to proteinuria and suspected rejection.

This study analyzes the clinical indications, histopathological diagnoses, and outcomes of 50 post-transplant kidney biopsies to guide better diagnostic and therapeutic decisions in renal transplant recipients [1].

Materials and Methods

Study Design: Retrospective observational study

Duration: From 2021 to 2025

Setting: Tertiary care nephrology center, Chatrapati Sambhaji Nagar

Sample Size: 50 patients who underwent post-transplant kidney biopsy

Data Collected

- Demographics (age, sex)
- Donor type and ABO compatibility
- Time since transplant
- Clinical indication for biopsy
- Serum creatinine levels
- Histopathological findings
- C4d staining results
- Treatment administered
- Clinical outcome post-treatment

Data were analyzed using descriptive statistics. Outcomes were assessed based on improvement or graft loss following therapy.

Observations and Results

Demographics and Transplant Characteristics

Mean age: 44.1 ± 10.2 years (Range: 21–67 years)

Sex: 32 males (64%), 18 females (36%)

Donor Type: 46 (92%) live while 4 (8%) Deceased

ABO Compatibility: 44 compatible (88%), 6 incompatible (12%)

Clinical Indications for Biopsy

Elevated creatinine: 28%

Delayed graft function (DGF): 36%

Graft dysfunction: 24%

Proteinuria: 12%

Biopsy Timing

Median time post-transplant: 4.8 months

<1 month: 34%

1–6 months: 46%

>6 months: 20%

Histopathological Diagnosis

Diagnosis	Cases (n)	%
CNI toxicity	16	32%
Acute tubular necrosis	14	28%
Acute ABMR	6	12%
T-cell mediated rejection	4	8%
Hyperacute rejection	2	4%
TMA	2	4%
Chronic rejection	2	4%
Normal histology	4	8%

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C4d Staining

Positive: 18 patients (36%)

Negative: 32 patients (64%)

Treatment and Outcomes

Treatment	Cases	Outcome (Improved / Graft Loss)
Dose modification of TAC	24	23 / 1
Plasma exchange ± IVIg	8	7 / 1
Steroid pulse ± ATG	4	4 / 0
Supportive (no specific therapy)	14	13 / 1

Overall improvement: 47 patients (94%)

Graft loss: 3 patients (6%)

Discussion

Biopsy remains the cornerstone in diagnosing the cause of graft dysfunction. In this study, CNI toxicity and ATN were the leading histological findings, consistent with early post-transplant injury patterns. The role of C4d staining was particularly useful in identifying ABMR, though the majority of rejection episodes were C4d-negative. ABO-Incompatible recipients had a higher incidence of antibody-mediated rejection and positive C4d staining.

Plasma exchange and IVIg were effective in managing ABMR. Most cases of CNI toxicity responded well to dose adjustment of tacrolimus. Overall graft outcomes were favorable, reflecting the importance of early diagnosis and appropriate intervention guided by biopsy findings [2-4].

Conclusion

post-transplant kidney biopsy provides critical insights into graft dysfunction etiology. Early detection of CNI toxicity, rejection, and ATN allows timely therapeutic modulation. C4d staining adds diagnostic clarity in ABMR cases. Routine biopsy for unexplained creatinine rise remains essential to preserve graft function and improve outcomes.

References

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