Human Pathology (2012) 43, 1192–1196

ELSEVIER

Human PATHOLOGY

www.elsevier.com/locate/humpath

Original contribution

A position paper on standardizing the nonneoplastic kidney biopsy report ☆

Anthony Chang MD [a,*], Ian W. Gibson MBChB, MD, FRCPath [b], Arthur H. Cohen MD [c], Jan W. Weening MD, PhD [d], J. Charles Jennette MD [e], Agnes B. Fogo MD [f]

[a] *Department of Pathology, University of Chicago Medical Center, Chicago, IL 60607, USA*
[b] *Department of Pathology, University of Manitoba, Winnipeg, Canada R3A 1R9*
[c] *Department of Pathology, Cedars-Sinai Medical Center, Los Angeles, CA 90048, USA*
[d] *Department of Pathology, Erasmus Medical Center Rotterdam, Tergooiziekenhuizen, Hilversum, The Netherlands*
[e] *Department of Pathology and Laboratory Medicine, University of North Carolina, Chapel Hill, NC 27599, USA*
[f] *Department of Pathology, Microbiology and Immunology, Vanderbilt University, Nashville, TN 37232, USA*

Received 2 March 2012; revised 8 April 2012; accepted 11 April 2012

Keywords:
Renal;
Reporting;
Parameter;
Standardization

Summary The biopsy report for nonneoplastic kidney diseases represents a complex integration of clinical data with light, immunofluorescence, and electron microscopic findings. Practice guidelines for the handling and processing of the renal biopsy have previously been created. However, specific guidelines for essential pathologic parameters that should be included in these pathology reports do not exist. The Renal Pathology Society has coordinated an effort through the formation of an ad hoc committee to enumerate the essential elements and pathologic parameters that should be reported for every biopsy specimen. This endeavor aims to establish a minimum reporting standard and to improve communication between pathologists and other physicians. This document represents the collective effort and consensus opinions of this ad hoc committee of the Renal Pathology Society.

1. Introduction

The biopsy report for nonneoplastic kidney diseases represents a complex integration of clinical data with light microscopy (LM), immunofluorescence (IF), and electron microscopic (EM) findings. In 2004, the Renal Pathology Society (RPS) published practice guidelines for the medical renal biopsy, which primarily addressed specimen handling and processing. These guidelines enumerated many important aspects of the renal biopsy but did not include recommendations for specific elements that should be stated in the final pathology report [1]. Multiple classification schemes for specific renal diseases, such as focal segmental glomerulosclerosis (FSGS) [2], lupus nephritis [3], immunoglobulin A (IgA) nephropathy [4], diabetic nephropathy [5], and pauci-immune crescentic glomerulonephritis [6], have been recently established. Although these classifications give nephropathologists guidance with categorization issues, they do not generally enumerate specific pathologic elements that should be reported. In addition, guidelines that may be broadly applied beyond these specific diagnostic entities do not currently exist.

Standardizing nonneoplastic kidney biopsy pathology reports is desirable to improve communication between the pathologist and clinician or clinical team and to minimize the

☆ This article is being published cooperatively in the *Clinical Journal of the American Society of Nephrology* and *Human Pathology*.

* Corresponding author.
E-mail address: anthony.chang@uchospitals.edu (A. Chang).

0046-8177/$ – see front matter © 2012 Elsevier Inc. All rights reserved.
doi:10.1016/j.humpath.2012.04.009

Table Essential pathologic parameters for reporting

- Clinical history/data
  - Brief summary of history provided by clinician or obtained from another authoritative source
- Gross description
  - No. of tissue core(s) for light microscopy and core length(s)
  - No. of tissue core(s) for immunofluorescence microscopy and core length(s)
  - No. of tissue core(s) for electron microscopy and core length(s)
- Microscopic description
  - Light microscopy
    - Histochemical stains (eg, periodic acid-Schiff, Jones methenamine silver, Masson trichrome, Congo red) or IHC performed
    - Presence of cortex/medulla/capsule/calyceal mucosa
    - Glomeruli
      - No. of glomeruli
        - No. of (%) global sclerosis (if present)
        - No. of (%) segmental sclerosis (if present)
        - No. of (%) crescents, cellular to fibrocellular (if present)
        - No. of (%) fibrinoid necrosis (if present)
      - Additional abnormalities (eg, hypercellularity, deposits, thrombosis, double contours, spikes)
    - Tubulointerstitium
      - Extent of interstitial fibrosis/tubular atrophy, at least semiquantitative
      - Interstitial inflammation, tubular injury, crystals
    - Arteries/arterioles
      - Intimal fibrosis (absent/present/severity)
      - Arteriolar hyalinosis (absent/present/severity)
  - Immunofluorescence microscopy
    - No. of glomeruli present
    - No. of globally sclerosed glomeruli
    - Staining intensity, location/pattern of staining for each antibody, and specify intensity scale (0-3+ or 0-4+)
    - Relative intensity of κ/λ staining of tubular casts
    - State when IF performed on paraffin sections
  - Electron microscopy
    - State when EM performed on tissue processed from paraffin sections
    - State whether a sample or all of the submitted tissue examined by toluidine or methylene blue stain
    - No. of glomeruli present in toluidine blue thick sections,
    - No. of globally or segmentally sclerosed glomeruli
    - No. of glomeruli with crescents or necrosis or proliferation
    - No. of glomeruli evaluated by EM
      - Absence or extent of podocyte foot process effacement
      - Absence or presence and location of electron dense deposits
      - GBM thickness (normal, thin, thick) and appearance (eg, layered)
        - If abnormal, state reference range of GBM thickness for age and sex
      - Additional abnormalities (eg, infiltrates, deposit substructure, fibrillary deposits, cellular interposition, tubuloreticular inclusions, fibrin tactoids)
      - Indicate tubulointerstitium was evaluated, specify if tubulointerstitial deposits present
      - Indicate peritubular capillary basement membrane was evaluated (for transplant biopsies), specify if multilayering present (focal *vs* diffuse)

omission of pathologic parameters that may have therapeutic or prognostic importance [7]. The reporting guidelines established in this article are applicable for both native and transplant kidney biopsies, but specific requirements that pertain only to the transplant setting have been explicitly stated in the appropriate sections below. It is important to acknowledge that prior efforts by renowned nephropathologists in several renal pathology textbooks have delineated many of the items that should be addressed within the kidney biopsy report [8-11]. This position paper builds upon these prior contributions and represents the collective effort and consensus opinions of the RPS ad hoc committee.

We thus recommend that the following headings should be present in all renal biopsy reports. The essential reporting elements are explained within each section and also summarized in the Table.

2. Clinical history or data

All relevant clinical history that is provided by the clinician or obtained from an authoritative source should be reported in this section. These data include but are not limited to relevant underlying medical diseases (eg, diabetes and hypertension), therapeutic or medication history, and test results. In particular, the presence and severity of proteinuria and/or hematuria, serum creatinine, and other relevant serologic or laboratory test results should be reported. For allograft biopsies, the date of transplant, cause of end-stage renal disease, and pertinent data of the donor should be stated, if known. The reason for an allograft biopsy, protocol versus clinically indicated, should be given.

3. Gross description

The number and length of tissue cores that are submitted for LM, IF, and EM, appropriate fixatives/transport media, should be recorded upon receipt of the biopsy specimen.

4. Microscopic description

4.1. Light microscopy

Histochemical stains (eg, periodic acid-Schiff, Jones methenamine silver, Masson trichrome, Congo red) or immunohistochemistry (IHC) used for evaluation should be enumerated. Additional step or level sections when obtained to search for focal lesions (eg, FSGS, intimal arteritis) should be reported. The absence or presence of renal cortex and/or medulla and, when appropriate, the presence of surface capsule (particularly relevant to renal allograft biopsy