Evolution of the Banff Working Classification of Renal Allograft Pathology: Updates and Future Directions

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Abstract

Renal transplant pathology is a complex and rapidly evolving field of surgical pathology and the pathologic interpretation of renal allograft biopsy pose significant challenges and opportunities to the renal transplant pathologists. Both allo-immune and non-immune factors often interplay in causing damage to the kidney allograft at different time intervals post-transplantation. An accurate identification of these etiologic factors is essential for the optimal management and better long-term outcome of the renal transplant patients and the biopsy plays a pivotal role in this process. The Banff classification was introduced as an international, consensus-based working formulation to harmonize the reporting of pathological lesions seen on renal allograft biopsies. The first meeting of the Banff group took place in 1991 at Banff, Canada and the first detailed publication on the classification appeared in 1993. Subsequent meetings have been held regularly every two years with regular updates, additions and revisions of the original classification. The latest meeting was held in Brazil this year (2013) and its detailed reporting is still due.

This editorial attempts to summarize the main changes that have taken place in the interpretation of renal allograft biopsy pathology and the Banff classification over the last two decades. The main focus of the paper will be on the evolution of the morphological and immunohistochemical changes, as these are still the mainstay of the Banff classification. The standardization and incorporation of the formal morphometric and molecular data into the Banff classification for practical use is still a challenge for the future.

Keywords: Antibody-mediated rejection; Banff schema; evolution; T cells; Transplantation

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Concomitant with the changes in ABMR category, changes also occurred in the category of active/acute rejection, which has been renamed as TCMR and divided into acute and chronic active categories, as for the ABMR [25-28]. The diagnostic criteria of the chronic active TCMR are still poorly characterized [26].

The most formidable challenge in the field of renal transplantation today is the progressive development of chronic changes in the allograft. The diagnosis, classification and grading of the chronic changes is equally important in guiding management and predicting the long-term graft outcome. Prior to 1991, the term “chronic rejection” was in widespread use for all causes of chronic allograft dysfunction. The Banff formulation introduced the term Chronic Allograft Nephropathy (CAN) as a descriptive alternative to the misleading term of “Chronic Rejection”. Banff 93 classification divided CAN into three grades based on the degree of tubular atrophy and interstitial fibrosis. No subdivision of CAN was made and all causes of chronic changes were lumped together in this category. In Banff 1995 meeting. Chronic Allograft Nephropathy Index (CADI) was integrated with the CAN category to grade the severity of the chronic changes [11,16]. In Banff 97 classification, a subdivision of each of the grades into “a” and “b” categories was done depending on the absence or presence of specific features related to “Chronic Rejection”. However, the grading of the CAN was not changed [17]. No modifications in CAN category were made in 97-update classification or Banff 2003 meeting reports. A major change in the category of chronic changes occurred in Banff 2005 meeting when the term CAN was eliminated and replaced by Interstitial Fibrosis/Tubular Atrophy (IFTA), no evidence of specific etiology [25]. The causes of “a” subcategory of CAN in previous classifications were moved to the “other” category, while the chronic allo-immune injuries were included in the respective categories of ABMR and TCMR. Thus, the category 5 in the Banff 2005 and onwards now includes only those cases of chronic changes in which no specific features of causal factors are found on the biopsy.

A more recent and innovative development is the establishment of international Banff Working Groups (BWGs) to conduct multicenter trials, collect data and produce evidence-based guidelines for revision and refinement of diagnostic criteria in the problematic areas of renal transplant pathology [27,28].

In conclusion, the Banff classification has become the major force for the uniform and standardized reporting of the pathological lesions on renal allograft biopsies throughout the world. The Banff classification is, by default, a flexible formulation and has undergone considerable evolution over the last two decades and much progress is still awaited.

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