Editorial for "Significance of Arterial Spin Labeling for Reducing Biopsies in Patients With Kidney Allograft Dysfunction"

Arterial spin labeling (ASL) is an emerging noninvasive magnetic resonance imaging (MRI) technique to assess cerebral perfusion by labeling blood water as it flows throughout the brain. ASL specifically refers to magnetic labeling of arterial blood below or in the imaging slab, without the need of gadolinium contrast. This method utilizes water molecules circulating with the brain and, by using a radiofrequency pulse, it tracks the blood water as it circulates throughout the brain. After a period of microseconds, a "label" image is captured.[1] ASL perfusion presents, as a major advantage, the fact that an exogenous tracer is unnecessary. For this reason, this is an attractive imaging technique for children as well as patients with contraindications or previous untoward reactions to gadolinium, those with renal failure, and those who need repeated follow-up imaging.[2]

Several ASL imaging techniques have been shown to get a reliable measurement of the renal perfusion for both healthy volunteers and those patients with one or more of the following pathologies: renal diseases, arterial stenosis, renal neoplasms, and allografts.[3] A recent meta-analysis reviews the role of ASL in assessing perfusion impairment in renal allografts, indicating that compared with healthy kidney transplant patients, renal ASL perfusion values were significantly lower in subjects with the functional imbalance of kidney transplants, with a positive correlation in the estimated glomerular filtration rate.[4]

In this issue, the authors assess the significance of ASL in 46 patients, in order to discriminate those with posttransplant allograft dysfunction who need biopsy from those who do not.[5] Cortical ASL in the group who needed biopsy was significantly lower than in the other group. Additionally, elevated serum creatinine differentiated necessary from the unnecessary group. The combined use of ASL and serum creatinine yielded a high specificity for selecting patients who may not need allograft biopsy.

The essential role of kidney biopsy after kidney transplantation is beyond any doubt. Histopathology is crucial in the assessment of the kidney's condition for a more precise prognostic evaluation of long-term graft dysfunction. Kidney allograft biopsy is an important tool for posttransplant management and it is the gold standard for diagnosis of various allograft injuries, including acute or chronic active rejection, BK polyomavirus-associated nephropathy, calcineurin inhibitor toxicity, and recurrent or de novo glomerular diseases.[6,7] The complication rate after percutaneous renal biopsy ranges between 2% and 10%, including hematuria, micro, and macroscopic (2%), with a transfusion requirement of less than 1%, perirenal hematoma, and pain at the puncture site. Other less frequent complications include arteriovenous fistula and, more exceptionally, pseudoaneurysm. Only 0.2% require surgical or radiological intervention, such as selective embolization for fistulas, aneurysms, or hematoma drainage.[8,9] Most likely ASL could help to reduce the complications after kidney grafting, although no data about this issue are included in this article. In the same way, it would be interesting to investigate whether it could avoid protocol biopsies after kidney transplantation, an issue that is still controversial to date.[10]

This is an interesting article that establishes ASL as an important tool to identify those patients who may not need allograft kidney biopsy, in order to reduce adverse effects in patients. Further studies are warranted to fully integrate this technology in the follow-up of patients with transplants.

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Technical Efficacy: Stage 3