Is Incidental ("Drive-By") Renal Arteriography Justified in Patients with PVD or Carotid Stenosis?

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Background

Incidental, or "drive-by" renal arteriography during diagnostic arteriography of other arteries has become an increasingly common and controversial practice. Proponents of such practice generally point to the relatively high prevalence of renal artery stenosis (RAS) with coronary and peripheral arterial occlusive disease. Such "incidental" renal artery lesions are often then subjected to therapeutic interventions that are of questionable need and impose additional cost and risk to the patient.

There are several studies indicating a prevalence of significant (? 50–60%) RAS with peripheral arterial occlusive disease in the range of 12 to 20%.[1–5] Although RAS appears to be sufficiently prevalent to justify such incidental screening studies during peripheral arteriography, one must also factor the increased cost and potential risk of adding such incidental studies. Perhaps an even greater consideration is whether the identification of RAS in a population of patients in whom it is not already clinically suspected will lead to any benefit to the patient. Recent studies on medical treatment versus balloon angioplasty for renal artery stenosis and hypertension do not show any significant advantage with intervention.[6–8]

In order to better evaluate the need for routine use of such incidental renal arteriography in our practice, we studied a group of 200 consecutive peripheral arteriograms performed for symptomatic lower extremity arterial occlusive disease. Another goal of the study was to identify risk factors associated with RAS, renovascular hypertension (RVH), and ischemic nephropathy.

Methods

Over a 6-month period (January 1 through June 30, 2004), 200 consecutive patients undergoing angiographic evaluation of symptomatic lower extremity PAD were studied. Angiograms were reviewed for the presence of RAS (defined as ? 25% diameter reduction in either renal artery). Angiographic findings were then correlated to the clinical diagnosis of RVH (> 50% RAS and ? three-drug resistive hypertension) and ischemic nephropathy (defined as > 50% bilateral RAS, three-drug hypertension, and creatinine ? 1.5). Angiographic findings were also correlated with demographics and atherosclerotic risk factors (hypertension, tobacco smoking, hyperlipidemia, coronary disease, and excretory renal dysfunction). Each of these factors was examined to determine if a relationship correlated to the presence of and degree of RAS present an attempt to justify incidental renal angiography.

Results

The overall prevalence of any degree of RAS in this study population was 26% (52 patients). Only 24 (12%) patients had an incidental finding of ? 50% stenosis in either renal artery. Six (3%) of these patients were found to have associated RVH. Additionally, nine (4.5%) patients had coexistent renal insufficiency and significant RAS, five with ESRD on chronic hemodialysis. None of the four patients with renal insufficiency not on dialysis and only one with ESRD had poorly controlled three-drug hypertension. Thus definitive ischemic nephropathy was present in only one (0.5%) patient. Statistically significant risk factors associated with the presence of RAS include hypertension ($p < .001$), coronary disease ($p = .024$), female gender ($p = .010$), diabetes ($p = .039$), aortoiliac disease ($p = 0.031$), multiple levels of PAD ($p < .001$), and age over 60 ($p < .001$).

Discussion

Our findings are consistent with other studies that indicate a prevalence of > 50% RAS in patients with lower extremity PAD in the range of 12 to 20%. When evaluated more closely for those with stringently defined RVH or ischemic nephropathy, the numbers are quite low. Since it is only these severely effected patients with RAS who are thought to possibly benefit from renal revascularization, one must certainly question the rationale for routine, incidental renal arteriography.

There are several additional reasons to question the need for incidental renal arteriography. As briefly mentioned earlier, balloon angioplasty has not been found to be conclusively superior to medical therapy alone in patients with RVH. In a Cochrane Database Systematic Review of three randomized clinical trials, there was no statistically significant change in blood pressure or renal function during follow-up. Criticisms of the studies summarized in the report include the relatively low use of stents and limited follow-up. Nonetheless, given the low prevalence of significant RAS in patients with peripheral vascular disease, coupled with the questionable benefit of intervention in these few patients, one must conclude that incidental renal arteriography is of little or no value.

Some investigators point to the possibility of unrecognized RAS disease progression leading to renal artery occlusion as justification for incidental renal arteriography. Indeed, Zierler and colleagues have shown that the cumulative incidence of progression from < 60% RAS to ? 60% RAS of approximately 20% per year, and progression from ? 60% RAS to occlusion of about 5% per year.[9] While such disease progression is clearly of concern it is unlikely to occur in the absence of clinical findings indicative of RVH and can be detected and followed accurately and economically using non-invasive and less expensive imaging modalities.

Another potential justification for incidental renal arteriography is to identify patients with RAS in order to avoid use of angiotensin converting enzyme inhibitors (ACEIs) in the treatment of hypertension, an almost universally ubiquitous disease in these patients. A published review of 12 randomized clinical trials that evaluated ACEIs or angiotensin receptor blockers in patients with renal insufficiency showed an initial increase in serum creatinine that stabilized within 2 months with long-term preservation of renal function.[10] The authors concluded that withdrawal of ACEIs in such patients should occur only when the rise in creatinine exceeds 30% above baseline within the first 2 months or if hyperkalemia develops. It would appear then that ACEIs can be safely used in patients with RAS if appropriately monitored.

To some degree the issue of incidental renal arteriography during evaluation of lower extremity peripheral arterial occlusive disease or carotid stenosis is moot. Flush aortography of the visceral aortic segment is generally performed as a matter of routine when lower extremity ischemia is investigated with arteriography. Although greater anatomic detail is provided with select renal injections, the aortic portion of the study will generally provide sufficient information regarding the renal arteries to satisfy as a "screening" study for RAS. As this pertains to carotid artery disease, the issue is moot for another reason—routine use of carotid arteriography has all but disappeared with increased reliance upon duplex ultrasographic imaging prior to carotid endarterectomy. With the emergence of carotid stenting, however, the issue is certain to return.

The real controversy surrounding incidental renal arteriography, sadly, is not generated due to concerns regarding the detection, medical treatment, and subsequent follow-up of such incidentally discovered lesions, but is related to the performance of medically unnecessary or questionably necessary interventions upon these otherwise unsuspected lesions. Such use of "CPT-mining" is what stimulates the use of the term "drive-by renal" and warrants our condemnation. In these times of rapidly escalating health care costs, such practices will only serve to hasten external regulatory control and public distrust of the practice of medicine. The topic is perhaps best summarized by the late John Porter as opined in his final edition of the Year Book of Vascular Surgery during commentary of this very issue: "Perhaps data such as these will decrease cardiologists' drive-by renal artery stenting—but that's probably just wishful thinking. Science has never been a match for avarice."[11]

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