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Editorial

Endovascular approach to iliac artery stenosis and restenosis☆

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Starting with the 50-year-old pioneering work of Dotter, Gruntzig, and others, the role of endovascular revascularization has steadily expanded in the treatment of peripheral arterial disease.[1] Endovascular techniques that include balloon expandable stents, self-expanding stents, and stent grafts are applied everywhere in peripheral arterial tree but are actually preferred in the management of aorto-iliac atherosclerotic disease.[2] The immediate success rates with aorto-iliac endovascular therapy and especially with iliac stenting are over 95% with complication rates of less than 5% and the annual restenosis rates of about 10%. Hence, iliac artery lesions are routinely treated with "stent first strategy". However, not just the patient-related factors but also the lesion complexities related to the length, location, and total occlusion versus stenosis as defined by angiographic TASC criteria affect endovascular outcomes.[3] TASC-based guidelines exist, guiding the decision-making and the appropriateness of stenting versus surgery and medical therapy. Predictably, the usual indications for lower extremity revascularization including the aorto-iliac revascularization are limited to symptomatic conditions like lifestyle limiting claudication, rest pain, tissue loss, and less commonly, spontaneous distal embolization. However, due to the excellent results with short iliac stenosis, endovascular therapy is applied as a first line approach instead of trying initial trials of medical therapy and rehabilitation exercise as opposed to the approach for below the inguinal ligament arteries.

The iliac intervention technique is essentially the same for de novo lesions and restenotic lesions. Initial angiography that include angulated views of the aortoiliac region and complete run-off study to the feet is necessary; otherwise, the previously existing disease may be indistinguishable from periprocedural embolic events.

The initial access site is based on the operator preference but some generalizations can be made depending on the location of the lesion and stenotic versus occlusive lesion types (Fig. 1). The preferred access for a common iliac stenosis is retrograde ipsilateral femoral access approach. The ipsilateral approach allows adequate support for passage of wires and sheaths across often noncompliant and calcified vessels. For negotiating an occluded common iliac through ipsilateral access, contralateral femoral artery is also accessed and used to pass an additional catheter for complete angiography and to have access in case of contralateral vascular injury.

Ipsilateral retrograde common femoral and the adjacent external iliac are, sometimes, too diseased for sheath placement. This may be due to an external iliac occlusion that extends up to the common femoral junction leaving no room for an ipsilateral sheath. In such situations, contralateral femoral access with cross-over across the aortic bifurcation would allow access to external iliac lesions. For distal external iliac lesions, in particular, this would mean more complete treatment up to the junction of common femoral artery that may not be possible with an ipsilateral retrograde femoral access.

Totally occluded vessels have slightly different access approach compared to stenotic vessels in the absence of occlusive disease. This is because passage of wires across the totally occluded vessels is challenging and may require greater catheter support. Instead of using 0.035 in. steerable and flexible guide wires through a low profile catheter as done with stenotic vessels, hydrophilic wires with hydrophilic low profile catheters are preferred when crossing 100% blocked vessels. The wires in occluded lesions often travel subintimally and usually need to be prolapsed to dissect long distances of subintimal space before the wires are completely across the length of the occluded segments. The wires are then placed back in the true lumen either by the mere wire tip

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☆ This editorial is pertaining to the article: Contralateral approach to iliac artery recanalization with kissing nitinol stents present in the aortic bifurcation.
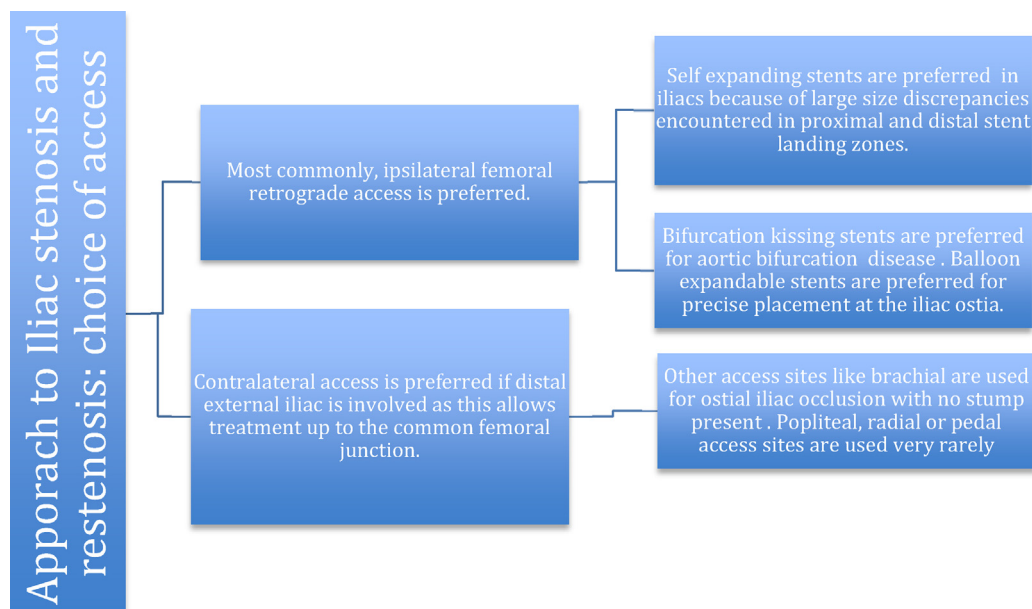
Fig. 1 – Selection of access site for endovascular treatment of iliac artery.

manipulation or failing this, with the aid of re-entry devices.[2] During subintimal passage, more supportive catheters and wires are needed for greater force required for crossing often calcified, hard, and chronic lesions.

Ipsilateral retrograde femoral access may be chosen when approaching occluded common iliac lesions but in case of false lumen entry into the aorta, re-entry into aortic true lumen may be more difficult from retrograde than wire passage from the antegrade contralateral approach.[2] Occluded common iliac, hence, may be better approached from contralateral femoral access as long as there is a proximal iliac stump allowing crossover catheter access to hook the proximal occluded vessel for catheter seating and guide wire passage. This is noted in this issue of the journal by the authors of the manuscript ''Contralateral approach to iliac artery recanalization with kissing nitinol stents present in the aortic bifurcation''. The authors appear to choose this approach both because of involvement of external iliac and the potentially easier wire passage of an occluded iliac from the antegrade approach. As discussed by these authors, brachial access has higher aortic arch complication risk but in yet another scenario of iliac disease, that is, if the common iliac is flush occluded at the ostium, left brachial access may be preferred as the contralateral access needs an iliac stump for catheter support. This is still a challenging scenario however as obtaining wire access to the true lumen when crossing a flush iliac occlusion is tough and complications can occur not only at the aortic arch level but also at the iliac level and a perforation here would need emergent covered stent placement after placement of an occlusive proximal aortic compliant balloon to control the bleeding from the perforation. Also, left brachial is more favorable than the right brachial as the site of origin of left subclavian is more distal on the aortic arch allowing a less tortuous course to the descending aorta compared to the sharply angulated course from the right arm to the lower

extremities. Popliteal, pedal artery, or radial access sites are rarely used for iliac intervention.

Self-expanding stents are preferred in iliac circulation because of size discrepancies between common iliac and external iliac and these stents are then sized to the larger diameter vessel segment. Self-expanding helps because of the large size discrepancies encountered in proximal and distal stent landing zones and also because of ectatic disease.

However, balloon expandable stents are preferred for aorto-iliac lesions. Kissing stent technique is often applied at the aorto-iliac site as noted by the authors of the manuscript ''Contralateral approach aortic bifurcation''. As opposed to these authors strategy, balloon expandable stents are preferred in ostial iliac lesions because of the precise landing zone and higher radial strength characteristics of balloon expandable stents that are useful in the calcified aortic bifurcation lesions that have a high recoil and need precise deployment. The authors used self-expanding stents to rebuild the aortic carina in the absence of any contraindication to such approach. Rebuilding the aortic carina superiorly as noted by these authors is customary when treating distal aortic bifurcation disease. Often, kissing balloon angioplasty or kissing stenting strategy is applied for bilateral ostial iliac disease but when stenting unilateral disease of distal aortic bifurcation, contralateral protection with a balloon is no longer considered necessary as noted on recent studies.[2]

In general, for de novo iliac stenoses, primary stenting is favored but provisional stenting is acceptable (stenting is mandatory if flow limiting dissection, residual stenosis of over 30% or systolic gradient >10 mm of Hg is seen after balloon angioplasty).

After lower extremity percutaneous revascularization, objective follow-up of arterial patency using anatomic imaging or physiological assessment is recommended even though less rigorous follow-up with non-invasive studies is needed