Adjunct internal iliac artery procedures in the context of endovascular abdominal aortic aneurysm repair: anything to stress on the consent form?

ABSTRACT:

Adjunct internal iliac artery (IIA) procedures, such as preoperative embolisation or coverage with iliac branch extensions, are not infrequent in the context of endovascular repair of abdominal aortic aneurysms. Moreover, on many occasions, these procedures are performed in a multi-stage approach by interventional radiologists prior to the main operation. Bearing in mind the potential complications of IIA occlusion when revascularization is not initially deemed necessary, various issues arise spanning from appropriate patient counselling to medicolegal consequences. Herein, we aim to provide a roadmap regarding appropriate patient consenting, highlighting the need for multidisciplinary approach of these patients.

KEYWORDS: aneurysm, aorta, endovascular, iliac artery

ABBREVIATIONS

EVAR — Endovascular repair of abdominal aortic aneurysms
IIA — Adjunct internal iliac artery
IBDs — Iliac branch devices
QoL — quality of life

Endovascular repair of abdominal aortic aneurysms (EVAR) has nowadays become the standard of care in appropriately selected cases, instead of the traditional open repair, resulting in a dramatic reduction of perioperative morbidity and mortality burdens [1, 2]. Accurate pre-operative planning with detailed angiographic study of the aneurysmal anatomy is of paramount importance, in order to achieve the key goals of the endovascular repair, one of which is the identification of appropriate proximal and distal landing zones for stent graft anchoring to ensure complete sealing, reducing the possibility of future endoleaks [3]. In this context, and referring to the distal landing zones of the stent graft in the iliac arteries, not infrequently, the operative strategy encompasses an adjunct pre- or intra-operative procedure to occlude the internal iliac artery(ies) [4, 5]. The latter can become necessary in order to allow the formation of an anatomically more favourable distal landing zone in the external iliac artery for the stent graft limbs or to permit simultaneous treatment of more extensive and complex aorto-iliac aneurysms in a one-stage endovascular procedure.

Although forgiving on most occasions to the surgeon, occlusion of the internal iliac artery can result in occurrence of major post-procedural complications, which can have a significantly negative impact on the patients’ quality of life (QoL) [6]. More specifically, given its anatomical distribution, internal iliac artery occlusion can result in the development of buttock claudication, sexual dysfunction or more infrequently in dramatic occurrence of irreversible soft tissue necrosis in the gluteal area/external genitalia, ischemia of the rectum/distal colon or even spinal cord ischemia [7, 8]. Under this notion, preservation of at least one of the two internal iliac arteries during EVAR is strongly recommended, assuming the presence of an adequately patent collateral network [9]. In 2017, Bosanquet et al. published a systematic review on the above-mentioned topic, reporting an overall incidence of buttock claudication in 30% of the patients who underwent internal iliac artery occlusion, along with 10% new onset erectile dysfunction and occurrence of major ischemic complications (gluteal region, colon-rectum, spinal cord) in only less than 1% of the cases [10]. Therefore, buttock claudication and new onset sexual dysfunction should be the main themes of relevant pre-operative counselling when occlusion of the internal iliac artery is planned in the context of EVAR.

With respect to buttock claudication after internal iliac artery occlusion, it is clinically manifesting as pain at the gluteal region during walking, being a result of regional ischemia. Despite the presence of multiple collateral circuits, originating from the inferior mesenteric artery, contralateral internal iliac artery, ipsilateral external iliac artery, lumbar arteries, ipsilateral deep femoral artery, which can preserve adequate blood flow, buttock claudication is a well-described and unfortunately not infrequent complication after EVAR [11]. In the immediate perioperative period, regional oxygen saturation of the gluteal region using near-infrared spectroscopy has been proposed as a method of assessing evolving critical blood flow induction with promising results [12]. With respect though to its long-term clinical course, this entity is on many occasions a self-limiting condition, mainly due to the gradual development of collateral circulation from the multiple circuits mentioned above; the allowed time interval for this to happen should roughly be expected at six or even up to twelve months post-operatively [13]. However, recent data suggest that the need for re-operation with internal iliac artery reconstruction is highly unlikely for the vast majority of patients with established symptomatology and a trial of non-operative management is the initial recommended step upon occurrence of this complication [14]. Hence, long-term follow-up of these patients is mandated and pre-operative

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counselling should encompass this potential problem, highlighting the expected long-term interval after which amelioration of the relevant symptoms usually occurs.

Regarding the occurrence of sexual dysfunction after internal iliac artery occlusion in the context of EVAR, as already mentioned, a detailed relevant pre-operative history is mandated for baseline assessment and documentation purposes, in order to identify pre-existing symptoms. One should bear in mind that the presence of an abdominal aortic aneurysm per se is usually associated with a notable atherosclerotic disease, the system nature of which does not spare the pelvic arterial circulation [15, 16]. In addition, despite the minimally invasive nature of endovascular procedures, it would be logical to assume that a great percentage of patients, particularly those under long-term aortic aneurysm surveillance, would suffer from understandable pre-operative stress and anxiety, a factor which is well associated with chronic sexual dysfunction [17]. From the technical point of view, inadequate systemic heparinisation prior to the beginning of the endovascular phase of EVAR, microembolisations in the pelvic circulation during manoeuvring of the guidewires, catheters and stent grafts, occlusion of the internal iliac artery unilaterally in the presence of significant atherosclerosis of the contralateral vessel or performance of bilateral internal iliac artery occlusion can all result — to a different extent — in the occurrence of de novo or exacerbation of long-standing sexual dysfunction postoperatively [18–20].

Aiming to avoid the potential complications related to the extended truncal occlusion/embolisation of the internal iliac artery(ies), particularly within the frame of endovascular repair of more complex aorto-iliac aneurysms, iliac branch devices (IBDs) are being increasingly used, with coverage of the internal iliac orifice, allowing flow preservation within the more distal branches of the vessel and reducing the need for subsequent major revascularisation procedures of the internal iliac artery [11]. Despite the logical concerns regarding the increased possibility of endoleak from a non-embolised ipsilateral internal iliac artery, the available data demonstrate a low re-intervention rate secondary to the occurrence of endoleaks, while allowing the preservation of flow within the iliac iliac arteries’ anastomotic complexes [21, 22]. However, one should bear in mind that incorporating the insertion of IBDs upgrades the technical complexity of a standard EVAR and increases the overall operating and fluoroscopy time, as well as the volume of contrast used. On the contrary, it enables a one-stop procedure for the patient and, by reducing the possibilities of adverse effects occurring after the internal artery embolisation, it may prove to be a more cost-effective therapeutic approach. Nevertheless, the local expertise of the parent surgical team and dynamic capabilities of the available interventional radiology services remain fundamental factors towards the wider adoption of iliac branch devices.

Considering the above-mentioned, the operating surgeon needs to have a detailed pre-procedural discussion with the patient, explaining the pros and cons of the proposed and alternative operative strategies. In addition, pre-existing symptomatology that could exacerbate after occlusion of the internal iliac arteries should be identified pre-operatively, so as to avoid the clinical and medicolegal implications of possible relevant complications, which will have aggravated pre-existing conditions, rather than created them de novo. Detailed history and clinical examination, along with accurate and precise assessment of the aneurysmal features’ anatomy should guide the operating team to propose the suggested treatment method and present possible alternative solutions. Referring to the potential complications though, one should be ready to quote not only the relevant data from the international literature, but also local institutional and even data from personal track records, so as to truly obtain an informed consent from the patient.

In addition, we believe that in cases where a multi-disciplinary team —comprising e.g. vascular surgeons and interventional radiologists— performs a multi-stage procedure (ie internal iliac artery embolisation followed by EVAR), the patient should be reviewed pre-operatively in a joint clinic setting by both specialties. The latter becomes more relevant given the lack of clinical trials comparing internal iliac artery occlusion versus internal iliac artery revascularisation in the context of aorto-iliac aneurysm repairs [23, 24]. In addition, proactive involvement of allied health specialists, such as psychologists, support workers, physiotherapists and vascular scientists can break communication barriers with the patients and facilitate the postoperative recovery from both physiological and psychological aspects [25]. Finally, there is an accepted consensus that the training curriculum of vascular/endovascular surgeons should encompass the impact EVAR and adjunct procedures can have on patients’ quality of life, aiming to develop a shared decision-making paradigm [26].

Obviously, the catastrophic sequel of an untreated expanding aneurysm bears more significance than the occurrence for instance of post internal artery embolisation transient buttock claudication, which will resolve within the first post-operative year. However, detailed pre-operative counselling on the issues related to the patients’ post-operative quality of life definitely strengthens the sense of trust with the surgeon and can help the surgeon overcome avoidable medicolegal consequences of suboptimal counselling.

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LETTER TO THE EDITOR