Remote endarterectomy of the iliac artery—A systematic review of literature (Protocol)

Table of contents

Header
Table of contents
Background
Objectives
Methods
Contribution of authors
Declarations of interest
References
Background

Several techniques are available to treat external iliac occlusive disease, of which percutaneous transluminal angioplasty (PTA) with or without stent placement, and open bypass surgery, are most used. Endovascular treatment comes with low mortality and morbidity, at the price of higher rates of restenosis and reinterventions. Open bypass surgery on the other hand has excellent long term patency rates, but it comes with relatively high morbidity and mortality. The TASC II classification advises endovascular treatment options for simpler lesions (TASC A & B), such as isolated external iliac artery (EIA) occlusions, and open surgical repair for more advanced lesions (TASC C & D), such as bilateral EAI occlusions and occlusions extending into the common femoral artery (CFA) (1). More recent literature suggest endovascular treatment even for these more advanced lesions (2). For atherosclerotic lesions of the CFA, open surgical repair consisting of an endarterectomy with or without patch is still regarded as gold standard. (3)

In patients with combined CFA and EAI occlusions, another treatment option is available: the remote endarterectomy. These patients will receive a groin incision for the endarterectomy of the CFA, and this allows for a minimally invasive treatment option for the EAI. A precursor of this technique was first described in 1953 by Barker and Cannon (4); the semi-closed endarterectomy. In this technique, arterotomies were made proximally and distally of the occluded arterial segment. Then, the intimal core was transected and removed. In 1969 this technique was improved by Vollmar, by introducing the ringstripper. This device is placed around the intimal core after transection, and then pushed inward to devide the intimal core from the outer vessel wall. (5) Still, either a relatively disease-free proximal segment was needed, or a proximal arterotomy had to be made. In 1996 Moll et al. introduced the Ring Strip Cutter. This device consists of double rings, which are advanced around the intimal core. At the desired transection site, both rings slide over each other, transecting the intimal core and allowing removal through a single incision (6). Nowadays, several variations of the technique are described, such as using a guide wire to guide the ring stripper, and performing direct or selective stenting of the proximal transection site.

In a selected group of patients, this technique may combine the benefits of endovascular and open surgical therapies. However, since its introduction some 20 years ago, only a handful of articles have been published reporting results of this technique. This systematic review aims to summarize available literature on remote endarterectomy of the iliac artery and give an overview of its technical and clinical outcomes.
Objectives

To determine the following properties of remote endarterectomy of the iliac artery

- Technical success
- Complications
- 30-day mortality rates
- Primary, primary assisted en secondary patency rates at different time points
- Clinical success, as defined by Rutherford et al (7)
- Improvement in ABI
- Restenosis en reocclusions.
- Reinterventions
- Target lesion revascularization rate
- Major and minor amputations

To compare these properties to other treatment options for iliac artery obstructive disease, being endovascular treatment (PTA with or without stenting) and open bypass surgery.
Methods

Criteria for considering studies for this review
We will include all English randomized controlled trials (RCTs), controlled clinical trials, or prospective or retrospective cohort studies reporting on the results of remote endarterectomy of the external and common iliac artery. Of studies which describe or compare multiple interventions, we will only include those in which data on the results of remote endarterectomy is reported separately. Only studies that report on ‘true’ remote endarterectomy will be included, i.e. using only an incision in the common femoral artery for stripping of the iliac. Studies reporting on semi-closed endarterectomy, using a groin incision and proximal iliac incision, will be excluded. The search term semi-closed endarterectomy will be included in the search, as sometimes these terms are used interchangeably. Poster abstracts, case reports, or letters to the editor will not included.

Search method
A comprehensive search will be performed based on the Preferred Reporting Items for Systematic Reviews and Meta-Analysis statement (PRISMA) (8). PubMed and EMBASE will be searched, scheduled on November 1st, 2015, using the following search terms as index terms or free-text words: “remote” or “semiclosed” or “semi-closed”, and “endarterectomy”, and “iliac”.

2 authors (J.B. and S.B.) will screen title and abstract of all search results independently for eligibility. Results will be compared after completing the screening process. Any discrepancies in selected studies will be resolved by discussion, and in doubt studies will be included for further screening.

Full-text articles will be than retrieved for all selected studies and will again independently be screened by J.B. and S.B., for meeting the in- and exclusion criteria as described earlier. Disagreement will be resolved by discussion, and if agreement cannot be reached, the final decision will be made by B.F. References and bibliographies of included articles will be searched for additional references.

Data extraction and management
Two authors, J.B. and S.B., will independently extract data from included studies. Data will be obtained using a standardized data form (appendix 1) to obtain the following information:
- Study characteristics and design
- In case of controlled trials, the type of intervention(s) that remote endarterectomy is compared to
- Results for all outcome measures as described earlier, when available at different time points, for remote endarterectomy, and when available for the intervention it is compared to.

Assessment of risk of bias in included studies
Risk of bias will be scored using The Cochrane Collaboration's 'Risk of bias' tool for assessing risk of bias for the included studies (Higgins 2011). This tool provides a protocol for judgements on the bias domains sequence generation, allocation methods, blinding, incomplete outcome data, selective outcome reporting and any other relevant biases. We will judge the domains to be at high, low or unclear risk of bias. We will resolve any disagreements by discussion with B.F.

Data analysis
Whenever possible, outcomes will be pooled. A Forrest plot will be constructed to display the results and to examine possible heterogeneity between the studies. In addition to the Chi square test, a Cochrane I2 test will be used to measure the amount of heterogeneity. If heterogeneity is present (I2 > 50%), we will use the random-effects model method for pooling. If not, a fixed-effect model will be used.

Subgroup analysis
We plan to conduct these subgroup analyses, if there are sufficient data:
- Intermittent claudication (IC) vs. critical limb ischemia (CLI)
- Primary stent placement at the proximal end vs. selective stent placement (i.e. only placing a stent in case of residual stenosis, intimal flap or other indication)
Contribution of authors

JB has written the protocol. JB and SB will do the literature search and data extraction. Potential discussions will be settled by BF. JB, SB, RS and HJ will perform data analyses and write the review. BF and JV will critically read the review and provide guidance during the writing process.
Declaration of interest

The authors have no conflicts of interest to report.


