The role of intra-operative duplex imaging in arterial reconstructions
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Record Status
This is a critical abstract of an economic evaluation that meets the criteria for inclusion on NHS EED. Each abstract contains a brief summary of the methods, the results and conclusions followed by a detailed critical assessment on the reliability of the study and the conclusions drawn.

Health technology
Intra-operative duplex imaging in arterial reconstructions.

Type of intervention
Diagnosis; treatment.

Economic study type
Cost-effectiveness analysis.

Study population
Patients undergoing arterial reconstructions.

Setting
Hospital. The study was carried out in Tacoma, Washington, USA.

Dates to which data relate
Effectiveness data were collected between September 1994 and May 1995. Dates associated with resource use and prices were not stated.

Source of effectiveness data
Effectiveness data were derived from a single study.

Link between effectiveness and cost data
The costing was undertaken on a different patient sample from that used in the effectiveness analysis.

Study sample
A total of 93 intra-operative duplex imaging studies were performed. Duplex scanning results were recorded for carotid endarterectomy (35), iliac balloon angioplasty and stent placement (12), and infra-red inguinal bypass (46).

Study design
The study was a case series. The duration of follow-up was not clearly stated although it appears to have been at least 6 weeks. The study was conducted in a single centre.

Analysis of effectiveness
The principle used in the analysis was not relevant. The main health outcome used in the analysis was the accuracy rate. Patients with abnormal intra-operative carotid duplex findings subsequently underwent intra-operative angiogram in order to corroborate the results. For the iliac artery balloon angioplasty with stent placement cases, post-stent placement imagings of the common femoral arteries were performed.

**Effectiveness results**
34 carotid endarterectomy patients (97%) had normal duplex findings. Three patients (9%) underwent intra-operative angiogram due to abnormal duplex findings and post-operative neurological deficit. In iliac balloon angioplasty and stent placement cases (12), both intra-operative duplex and C-arm post-stent angiography yielded comparable results in both normal (11) and abnormal (1) studies. In infra-inguinal bypass cases (46), 2 had abnormal duplex findings of the native vessels.

**Clinical conclusions**
Compared with traditional intraoperative angiography, the use of intra-operative duplex imaging is less invasive, no contrast material is used, the surgeon has the ability to evaluate the blood flow haemodynamics and repeat the examination multiple times if necessary. Also it is possible to assess the arterial lesion for progression and its resolution after the correction, and it is equally accurate when used as an adjunct to access surgical results of arterial reconstructions.

**Measure of benefits used in the economic analysis**
Since the effectiveness study showed the strategies to yield similar benefits, the economic study was based on the difference in costs only.

**Direct costs**
Hospital charges for the imaging procedures were used to approximate hospital costs. In addition, the authors reported the "average" time required for the imaging procedures to be performed, although the method of obtaining these estimates was not documented. The price year was not stated.

**Currency**
US dollars ($).

**Sensitivity analysis**
No sensitivity analysis was performed.

**Estimated benefits used in the economic analysis**
Not applicable.

**Cost results**
The hospital charge for intra-operative duplex examination in post-endarterectomy, iliac artery stents and infra-inguinal bypasses was approximately $200 per case. The associated reported "approximate" figures for intra-operative completion angiogram were $179 for carotid endarterectomy cases and $218 for infra-inguinal bypass cases. Intra-operative C-arm as used for completion angiogram was associated with "approximate" hospital charges of $479 for post-endarterectomy and $518 for iliac stents and infra-inguinal bypass cases.

**Synthesis of costs and benefits**
Not applicable.
Authors' conclusions
Compared with traditional intra-operative angiography, the use of intra-operative duplex imaging is a cost-effective and less invasive modality for evaluating arterial reconstructive surgeries.

CRD COMMENTARY - Selection of comparators
The reason for the choice of comparator is clear, as this was a widely used technique in the authors' setting. You, as a database user, should consider if this applies to your own setting.

Validity of estimate of measure of benefit
Data do not appear to have been used selectively to prove a particular point and the choice of health outcomes was justified. However, the uncontrolled study design used is a potential source of bias in the results.

Validity of estimate of costs
No adequate details of the methods of quantity/cost estimation were given, particularly in relation to the price year and the source of quantities of resource use. It should also be noted that charges were used to approximate true costs.

Other issues
Statistical analysis of costs was not performed. Cost data may not be generalisable to other settings or countries.

Source of funding
None stated.

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