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
The use of ultrasound-guided compression (UGC) was compared with ultrasound-guided thrombin injection (UGTI) for the treatment of post-catheterisation arterial false aneurysms (cFAs).

Type of intervention
Treatment.

Economic study type
Cost-effectiveness analysis.

Study population
The study population comprised patients with cFAs with a luminal diameter larger than 1.5 cm. Patients with smaller cFAs were excluded from the study.

Setting
The setting was secondary care. The economic study was carried out in Israel.

Dates to which data relate
The data for patients treated by UGTI were collected between July 1999 and February 2001. This group of patients was compared with a historical group of patients treated with UGC between June 1997 and June 1999. The price year was not reported.

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

Link between effectiveness and cost data
For patients treated with UGTI, the costing was undertaken prospectively on the same patient sample. For patients treated with UGC, the costing was undertaken retrospectively.

Study sample
No power calculations to determine the sample size were reported. In addition, no specific sample size appears to have been planned. All patients with a suspected cFA were evaluated by diagnostic duplex scan in a noninvasive vascular laboratory with an ultrasound scanner, utilising a 5-MHz linear array transducer. Between July 1999 and February 2001, 33 consecutive patients were diagnosed with cFA and treated by UGTI. This group was compared with a historical control group of 33 consecutive patients with cFA who were treated with UGC. The UGC and UGTI groups were
similar in age (66 versus 65 years) and male-to-female distribution (15:8 versus 14:19).

**Study design**
This was a prospective comparative study with historical controls that was carried out in a single centre. The duration of follow-up was not reported. It would appear that there was no loss to follow-up in any of the two groups. However, in the UGC group, one patient died prior to treatment and UGC could not be performed in two other patients because of underlying medical conditions (severe obesity and unstable cardiac condition).

**Analysis of effectiveness**
All of the patients included in the study were accounted for in the analysis. The outcomes used were:

- successful obliteration of the cFA;
- stay in the noninvasive vascular laboratory;
- procedure-related hospital stay;
- the number of complications (surgical site infection and superficial skin infection);
- the number of patients treated surgically;
- the operating room time; and
- the postoperative hospital stay.

The UGC and UGTI groups were similar in age, male-to-female distribution, and underlying medical conditions (e.g. ischaemic or rheumatic heart disease, hypertension, cigarette smoking and hyperlipidaemia.

**Effectiveness results**
Successful obliteration of the cFA was achieved in 26 patients (87%) in the UGC group and 33 patients (100%) in the UGTI group, (p=0.0460). Further, the difference in favour of UGTI in achieving fast cure during the first treatment session was highly significant, (p<0.0001).

Stay in the noninvasive vascular laboratory was 75 minutes per patient (range: 15 - 120) in the UGC group and 25 minutes per patient (range: 15 - 60) in the UGTI group.

The procedure-related hospital stay was 2 days per patient (range: 1 - 5) in the UGC group and 1 day per patient (range: 1 - 2) in the UGTI group.

Two patients (7%) in the UGC group and 1 patient (3%) in the UGTI group developed a superficial skin infection.

Six patients (20%) in the UGC group had to be treated surgically compared with none in the UGTI group. The mean operating room time in these patients was 1.5 hours per case (range: 1 - 2), with a mean postoperative hospital stay of 3 days (range: 2 - 24).

One patient undergoing surgery developed a surgical wound infection.

**Clinical conclusions**
The comparison of the two treatment groups showed the superiority of UGTI over UGC for the treatment of cFA, as UGTI was associated with a higher success rate in obliteration of the cFA than UGC.
Measure of benefits used in the economic analysis
No summary measure of benefit was derived. The study was, in effect, a cost-consequences analysis.

Direct costs
The direct costs of the hospital were included in the analysis. These were for the operating room, the noninvasive vascular laboratory, hospitalisation and thrombin. Other costs, such as surgeons' fees, were not included in the analysis. The cost analysis was based on local charges. As the costs appear to have been incurred during a short time, discounting was not relevant and was not performed. The resource quantities and costs were reported separately, with the authors also reporting the unit costs. The study reported the mean costs. The price year was not reported.

Statistical analysis of costs
The costs were treated as point estimates (i.e. the data were deterministic).

Indirect Costs
The indirect costs were not included in the analysis.

Currency
US dollars ($). The authors did not provide the results of any currency conversions.

Sensitivity analysis
No sensitivity analysis was performed.

Estimated benefits used in the economic analysis
See the 'Effectiveness Results' section.

Cost results
The cost of treating a patient was $1,150 with UGC versus $633 with UGTI. Thus, using UGTI over UGC translated into savings of about $517 per patient, or a 45% relative cost reduction.

Synthesis of costs and benefits
Not relevant.

Authors' conclusions
The comparison of the two treatment groups unequivocally showed the superiority of ultrasound-guided thrombin injection (UGTI) over ultrasound-guided compression (UGC) in the treatment of post-catheterisation false aneurysms (cFAs).

CRD COMMENTARY - Selection of comparators
Although no explicit justification was given for using UGC as the comparator, it would appear to represent current practice in the authors' setting. You should decide if this is a widely used health technology in your own setting.

Validity of estimate of measure of effectiveness
The analysis was based on a prospective comparative study with historical controls. Although it was appropriate for the study question, the potential for selection bias cannot be ruled out. Further, as the two groups were treated in different
time periods, differences in success rates could have also occurred due to better health technologies, better management strategies, better health care, and other such factors occurring over time. The study sample was representative of the study population, and the patients groups were found to be comparable in terms of their age, gender distribution and underlying medical conditions. The results from statistical analyses were not given for every outcome measure, but differences in treatment success rates between the two groups, the most important outcome measure in the study, were appropriately tested using Fisher's exact test.

Validity of estimate of measure of benefit
The authors did not derive a summary measure of health benefit. The analysis was, in effect, a cost-consequences analysis.

Validity of estimate of costs
All the categories of cost relevant to the hospital perspective adopted were included in the analysis. However, some relevant associated costs (e.g. surgeons' fees) were excluded from the analysis. This omission is likely to have biased the results in favour of UGC, as 20% of the patients in this group underwent surgery compared with none in the UGTI group. The costs and the quantities were reported separately, which will enhance the generalisability of the authors' results. The unit costs and charges were derived from local charges, but the authors did not explicitly name the source. No statistical analysis of charges and resource use was performed, hence the uncertain reliability of the authors' conclusions. Discounting was unnecessary since all the costs were incurred during a short time. The dates to which the prices related were not reported, nor did the authors report the results of any currency conversions or the exchange rate used to convert prices from local currency to US dollars. These limitations will hamper any future reflation exercises on the authors’ cost results. The authors also used charges to proxy prices.

Other issues
The authors made appropriate comparisons of their findings with those from other studies that found similar success rates for both treatment modalities. The issue of generalisability to other settings was not addressed. The authors do not appear to have presented their results selectively and their conclusions reflected the scope of the analysis. The authors acknowledged a limitation to their study in that it was not based on a prospective randomised trial and, as such, selection bias cannot be completely ruled out. Nevertheless, the authors found results that were in agreement with those published in the literature.

Implications of the study
Based on their results, the authors recommended that UGTI should become the procedure of choice to treat cFAs. However, they also pointed out that further studies are required to elucidate the pharmacological and haemodynamic mechanisms of this treatment modality.

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