

for logistical problems ($n = 11$), severe hemodynamic instability after computed tomography angiography ($n = 7$), or refused surgery ($n = 5$). This left 116 patients for randomization. The primary end point rate was 42% for EVAR and 47% for OR (absolute risk reduction, 5.4%; 95% confidence interval [CI], -13% to 23%). The 30-day mortality was 21% in patients assigned to EVAR compared with 25% for OR (absolute risk reduction, 4.4%; 95% CI, -11% to 20%). The mortality was 30% (95% CI, 26%-35%) in all surgically treated patients in the nonrandomized cohort and was 26% (95% CI, 20%-32%) in patients with unfavorable anatomy for EVAR treated by OR at trial centers.

Comment: The 30-day mortality for open repair in this study was <30%, considerably lower than the 48.5% postulated before the study. A subanalysis by the authors suggests that excluding patients highly unstable for OR was not the reason for the unanticipated low operative mortality of OR. It appears that OR in centers of excellence may be a better operation for RAAA now than in the past. A combination of the improved OR for RAAA and the large percentage of patients with RAAA unsuitable for conventional EVAR suggests the effect of EVAR on overall outcomes for treatment of RAAA may be less, and perhaps considerably less, than previously suggested.

Long-Term Clinical Effectiveness of Supervised Exercise Therapy Versus Endovascular Revascularization for Intermittent Claudication from a Randomized Clinical Trial

Fakhry F, Rouwet EV, den Hoed PT, et al. *Br J Surg* 2013;100:1164-71.

Conclusions: Over the long-term, supervised exercise therapy (SET)-first or endovascular revascularization (ER) therapy-first treatment strategies are equally effective in improving the quality of life and functional performance in patients with intermittent claudication. There are significantly higher numbers of total invasive interventions in the ER-first group. This supports a SET-first treatment strategy for intermittent claudication.

Summary: SET and ER both improve walking performance and quality of life in patients with intermittent claudication (Spronk S et al, *Radiology* 2005;235:833-42; and Watson L et al, *Cochrane Database Syst Rev* 2008;CD000990). The Comparing Exercise Therapy with Angioplasty for Claudication (CETAC) Trial (Spronk S et al, *Radiology* 2009;250:586-95) and a systematic review comparing ER and SET for treatment of intermittent claudication concluded that SET and ER were equally effective after 12 months (Frans FA et al, *Br J Surg* 2012;99:16-28). The current report represents an attempt to provide longer follow-up of the CETAC trial to provide an estimate of long-term clinical effectiveness of a SET-first or an ER-first treatment strategy for patients with intermittent claudication. CETAC was a single-center randomized trial that compared SET vs ER as the initial treatment for patients with intermittent claudication. A total of 151 patients were randomly assigned to SET ($n = 75$) or ER ($n = 76$). After a median follow-up of ~7 years (range, 0.07-9.17 years), there were 17 deaths in the SET group and 15 in the ER group. Completeness of long-term follow-up was 71% in the SET group and 84% in the ER group (36 patients available for review in the SET group and 47 in the ER group). Outcome measures were functional performance (pain-free maximum walking distance, ankle-brachial pressure index), quality of life, and the number of secondary interventions measured at baseline and at ~7 years of follow-up. Repeated-measurement and Kaplan-Meier methods were used for data analyses. Data were analyzed on an intention-to-treat basis. After 7 years, functional performance ($P < .001$) and quality of life ($P < .005$) improved after both SET and ER. The number of secondary interventions was higher in the SET group ($P = .001$). The total number of endovascular and surgical interventions (primary and secondary) was significantly higher with the ER-first strategy, 64 interventions in the SET group and 121 in the ER group ($P < .001$). There were two minor amputations in the SET group and three major amputations in the ER group.

Comment: The study has some limitations in that not all patients were available for long-term follow-up, and the mortality and attrition rate

decreased the power to detect small differences between the SET and ER groups. In addition, the authors did not collect information on regular exercise performed after the trial. Only endovascular and surgical procedures were considered secondary interventions. Nevertheless, the study still strongly argues that to minimize total procedures in patients with intermittent claudication, a SET-first rather than ER-first treatment strategy is preferred.

Systematic Review of Exercise Training or Percutaneous Transluminal Angioplasty for Intermittent Claudication

Frans FA, Bipat S, Reekers JA, et al. *Br J Surg* 2012;99:16-28.

Conclusions: The combination of percutaneous transluminal angioplasty (PTA) and exercise therapy (ET) may be superior to ET or PTA alone for treatment of intermittent claudication.

Summary: One goal in patients with intermittent claudication is to improve their walking distance with the thought that this will subsequently improve their quality of life. Percutaneous transluminal angioplasty (PTA), surgery, drugs, and exercise therapy (ET) all can improve symptoms in patients with intermittent claudication. Systematic reviews have demonstrated superiority of supervised ET (SET) over unsupervised ET for both increasing pain-free and maximum walking distance (Bendermacher BL et al, *Cochrane Database Syst Rev* 2006;CD005263; and Wind J et al, *Eur J Vasc Endovasc Surg* 2007;34:1-9). A Cochran review (Fowkes FG et al, *Cochrane Database Syst Rev* 2000;CD000017) indicated that there was greater short-term benefit with PTA than with exercise in patients with intermittent claudication but that the effect was not sustained after 1 to 2 years. A second review found medical treatment (home or SET, plus risk factor modification) resulted in longer walking distances than PTA at 1 to 2 years (Wilson SE, *Ann Vasc Surg* 2010;24:498-502). The authors noted that since this review, six additional randomized clinical trials have compared PTA and ET during the past 5 years. They therefore decided to perform a systematic review to summarize the results of all randomized clinical trials comparing PTA with ET therapy. Their goal was to obtain the best estimate of the relative effectiveness of these two approaches. They performed a systematic review of relevant randomized clinical trials identified from MEDLINE, Embase, and Cochrane Library Databases. To be included in the review, the trial had to compare PTA with ET in patients with intermittent claudication secondary to aortoiliac or femoral popliteal occlusive disease, or both. There were 258 initial articles identified with 11 (reporting data on eight trials) meeting inclusion criteria. There was one trial with isolated aortoiliac obstruction, three trials with femoropopliteal disease, and five with combined lesions. Two trials compared PTA with advice for ET, 4 trials compared PTA with SET, 2 trials compared PTA plus SET with SET alone, and 2 trials compared PTA plus SET with PTA alone. The authors concluded that heterogeneity precluded pooling of the data even though the end points in most trials were walking distance and quality of life. Their analysis indicated the effectiveness of PTA and ET was equivalent, although PTA plus ET provided greater improvement of walking distance and some domains of quality of life analysis compared with PTA alone or ET alone.

Comment: The article does indeed provide a good summary of the most up-to-date information currently available on the effectiveness of ET and PTA in patients treated for intermittent claudication. The data suggest that SET and PTA can both be effective in improving walking distance in patients with claudication. Neither therapy is perfect. ET is noninvasive, seemingly relatively inexpensive, and with less risk compared with PTA. However, PTA may be more universally applicable and more quickly effective than ET. Eventual failure rates are high with PTA treatment of femoral popliteal disease, but angioplasty of infrainguinal arteries is a moving target, with improvements of percutaneous techniques, such as drug-eluting balloons and stents, potentially shortly down the road. Two important questions not addressed in this study include the cost effectiveness of each treatment strategy and the potential for each treatment strategy to convert patients from claudication to critical limb ischemia with therapy failure.