esomeprazole or rabeprazole at high doses.[11] Additionally, amoxicillin three times a day could have been prescribed as it was proposed in east Asia, potentially increasing the eradication frequency.[12] Furthermore, these results might not be generalisable to other populations; Asians tend to be smaller and lighter than individuals of other ethnic origins and therefore the smaller volume of antibiotic distribution might have positively affected the outcome of treatments.

With regard to adverse events, beyond the usual symptoms, there was a consequence of treatment not yet assessed—ie, the effect on gut microbiota with long-term effects on the patients that might be different according to the compounds used. Also the discrepancy (up to 5%) between the results of phenotypic and genotypic resistance for both clarithromycin and fluoroquinolones raises a question about the most accurate method for susceptibility testing.

Overall, this study shows that some empirical treatments, especially bismuth quadruple therapy, can lead to excellent eradication frequencies, thanks to bismuth salts and tetracycline for which no resistance is usually found and can therefore be an alternative to the tailored treatments after antimicrobial susceptibility testing. If concomitant therapy, the other effective regimen in the study, is used, the recommended treatment duration should be 14 days unless 10 days are proven effective locally.[11]

Francis Megraud, Javier P Gisbert
Laboratoire de Bactériologie, Hôpital Pellegrin, Place Amélie Raba-Léon, 33076 Bordeaux, France (FM); and Gastroenterology Unit, Hospital Universitario de La Princesa, Instituto de Investigación Sanitaria Princesa and Centro de Investigación Biomédica en Red de Enfermedades Hepáticas y Digestivas, Madrid, Spain (JPG)
francis.megraud@chu-bordeaux.fr

We declare no competing interests.

1 Marshall BJ, Warren JR. Unidentified curved bacilli in the stomach of patients with gastritis and peptic ulceration. *Lancet* 1984; **1:** 1311–15.
2 Matysiak-Budnik T, Heyman M, Candalh C, Lethuaire D, Mégraud F. In vitro transfer of clarithromycin and amoxicillin across the epithelial barrier: effect of *Helicobacter pylori*. *J Antimicrob Chemother* 2002; **50:** 865–72.
3 Lamouliatte H, Cayla R, Megraud F, et al. Amoxicillin-clarithromycin-omeprazole: the best therapy for *H pylori* infection. *Acta Gastroenterol Belg* 1993; **56:** 140.
4 Megraud F, Coenen S, Versporten A, et al; Study Group participants. *Helicobacter pylori* resistance to antibiotics in Europe and its relationship to antibiotic consumption. *Gut* 2013; **62:** 34–42.
5 Selgrad M, Meissle J, Bornschein J, et al. Antibiotic susceptibility of *Helicobacter pylori* in central Germany and its relationship with the number of eradication therapies. *Eur J Gastroenterol Hepatol* 2013; **25:** 1257–60.
6 Oleastro M, Ménard A, Santos A, et al. Real-time PCR assay for rapid and accurate detection of point mutations conferring resistance to clarithromycin in *Helicobacter pylori*. *J Clin Microbiol* 2003; **41:** 397–402.
7 Molina-Infante J, Lucendo AJ, Angueira T, et al; European Registry on *H pylori* management (Hp-EuReg). Optimised empiric triple and concomitant therapy for *Helicobacter pylori* eradication in clinical practice: the OPTRICON study. *Aliment Pharmacol Ther* 2015; **41:** 581–89.
8 Gisbert JP, Calvet X. Review article: non-bismuth quadruple (concomitant) therapy for eradication of *Helicobater pylori*. *Aliment Pharmacol Ther* 2011; **34:** 604–17
9 Nyssen OP, McNicholl AG, Megraud F, et al. Sequential versus standard triple first-line therapy for *Helicobacter pylori* eradication. *Cochrane Database Syst Rev* 2016; **6:** CD009034.
10 Liou J-M, Fang Y-J, Chen C-C, et al, for the Taiwan Gastrointestinal Disease and Helicobacter Consortium. Concomitant, bismuth quadruple, and 14-day triple therapy in the first-line treatment of *Helicobacter pylori*: a multicentre, open-label, randomised trial. *Lancet* 2016; published online Oct 18. http://dx.doi.org/10.1016/S0140-6736(16)31409-X.
11 Malfertheiner P, Megraud F, O'Morain CA, et al; on behalf of the European Helicobacter & Microbiota Study Group and consensus panel. Management of *Helicobacter pylori* Infection Maastricht V/ Florence Consensus Report. *Gut* (in press).
12 Furuta T, Sugimoto M, Yamade M, et al. Effect of dosing schemes of amoxicillin on eradication rates of *Helicobacter pylori* with amoxicillin-based triple therapy. *J Clin Pharmacol* 2014; **54:** 258–66.

Selection, technique, and follow-up: keys to success in EVAR

Published Online October 12, 2016 http://dx.doi.org/10.1016/S0140-6736(16)31840-2

See Articles page 2366

Short-term survival benefits of endovascular aneurysm repair (EVAR) versus open repair of elective abdominal aortic aneurysms have been shown in randomised trials, but this early survival benefit is lost within a few years.[1–3] The long-term survival benefit of EVAR remains unclear.[4]

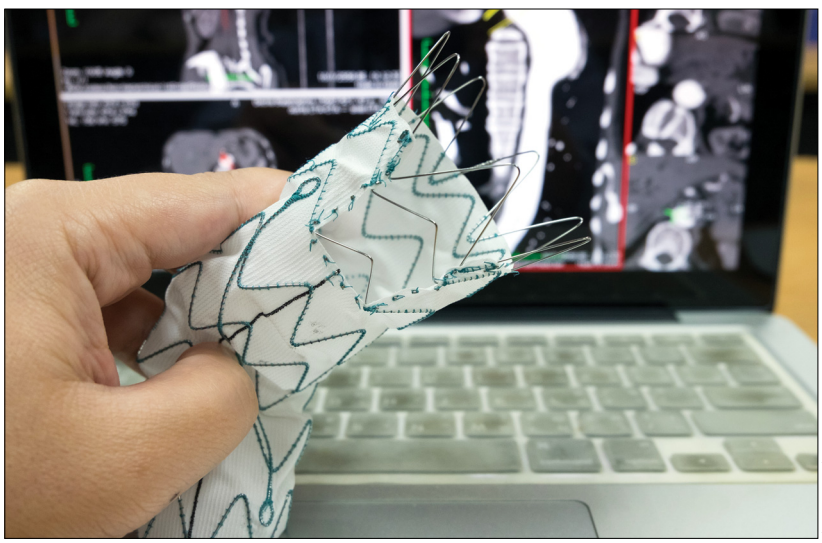
The randomised controlled EVAR trial 1 was initiated in 1999, and the EVAR trial participants and authors are to be congratulated for their persistence to obtain these long-term data in this aneurysm population suitable for both open repair and EVAR.[1] In Rajesh Patel and colleagues' EVAR trial 1[5] reported in *The Lancet*, over a mean of 12·7 years' follow-up (max 15·8 years), they show no significant difference between the randomly assigned groups in total mortality (9·3 deaths per 100 person-years in the EVAR group *vs* 8·9 deaths per 100 person-years in the open-repair group) or aneurysm-related mortality

(1·1 deaths per 100 person-years in the EVAR group *vs* 0·9 deaths per 100 person-years in the open-repair group). An early and significant survival benefit was noted in the EVAR group at 6 months after randomisation (adjusted hazard ratios 0·61, 95% CI 0·37–1·02 for total mortality; and 0·47, 0·23–0·93, p=0·031 for aneurysm-related mortality), and only after 8 years did open repair have a significantly lower mortality (1·25, 1·00–1·56, p=0·05 for total mortality; and 5·82, 1·64–20·65, p=0·006 for aneurysm-related mortality). The increased aneurysm-related mortality beyond 8 years was mainly attributable to secondary aneurysm sac rupture post-EVAR. Overall, aneurysm re-intervention rates were higher in the EVAR than in the open-repair group (4·1 and 1·7 per 100 person-years; p<0·0001) with most re-interventions taking place within 4 years of the initial treatment.[5]

In this trial, patients were treated more than 12 years ago and, fortunately, medical and endovascular management have since progressed. Case selection, device choice,[6] and planning with technical skills by use of simulation,[7] imaging modalities with decreased radiation, best practices in medical treatment, and surveillance programmes in centralised aortic units have all improved the overall management of aortic aneurysmal disease.[8] Although the EVAR trial 1 will always be a landmark trial, the long-term findings with only 57% of patients being alive at the end of follow-up should be interpreted with caution because of the following limitations.

The data collection from 10–15 years risks bias since it was done both retrospectively and prospectively, and relies on data from NHS records for procedures at the time of patient discharge (Hospital Episode Statistics) and trial-based data. The benefit was that patients lost to follow-up were retrieved and that re-interventions after open repair, such as incisional hernia repair, not collected before 2009, could be included in a retrospective manner. Follow-up for mortality (the primary outcome) was unchanged between 1999 and 2015.

In 1999, the mean age at randomisation for the EVAR trial 1 was 74 years, indicating that patients were a high-risk group for malignancy based on age rather than radiation exposure. The difference in total malignancy deaths at 15 years is small (126 in the EVAR group *vs* 123 in the open-repair group) and in fact more malignancy deaths were noted in the open-repair group at time intervals 6 months to 4 years and at 4–8 years. Appropriate investigation and robust data are needed and any insinuation that EVAR predisposes to or increases the risk of cancer might be dangerously misleading.



chanawit/Fotolia

The long-term surveillance after aneurysm repair in the UK trial, a country known for its evidence-based medicine, was astonishingly low despite reports warning the endovascular community about the importance of lifelong follow-up.[9]

Unfortunately, imaging data have not yet been included to explain why aneurysms excluded with second and third generation devices still rupture during long-term follow-up. Was this aneurysm growth or rupture caused by true device failures[10] (eg, fractures, migration, endoleak type I or III), or was the initial stent graft not deployed within 3 mm of the lowest renal artery? Was surveillance continued for long enough (median CT surveillance six scans [IQR 3–8] in EVAR group *vs* three scans [1–6] in open-repair group[5]) and were serious and life-threatening complications managed appropriately by secondary interventions (such as by relining, coiling, proximal fenestrated cuff) to save the patient's life?[10] Local investigators in this trial by Patel and colleagues[5] were at liberty to treat patients to their best knowledge, but some complications that are now known to cause aneurysm rupture were not treated.[11]

EVAR has gained enormous popularity worldwide with a lower initial operative mortality than open repair. Secondary ruptures after EVAR account for the long-term increase in aneurysm-related mortality. These findings, confirmed by 15 years of follow-up data from the EVAR 1 trial,[5] should alert physicians managing abdominal aortic aneurysms and might have implications for case

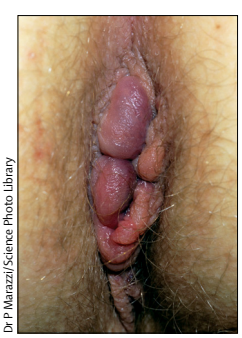
selection, patients' treatment choices, and continuous surveillance after EVAR. These results also show that long-term follow-up of surgical innovations is crucial.[12]

Isabelle Van Herzeele, Frank Vermassen
Department of Thoracic and Vascular Surgery, Ghent University Hospital, Ghent, 9000, Belgium
isabelle.vanherzeele@ugent.be

IVH is an adviser for Medtronic Academia and Silk Road Medical, has received research grants from Medtronic Academia and W L Gore & Associates, and has a research grant from Simbionix, which is unrelated to the topic of this Comment. FV is a consultant for Medtronic, W L Gore & Associates, Cook Inc, and Bloomingdale. Medtronic, W L Gore & Associates, Cook Inc, and Bloomingdale have been involved in training workshops for EVAR procedures and registries using later generation stent grafts.

1 The EVAR trial participants. Comparison of endovascular aneurysm repair with open repair in patients with abdominal aortic aneurysm (EVAR trial 1), 30-day operative mortality results: randomised controlled trial. *Lancet* 2004; **364:** 843–48.
2 Prinssen M, Verhoeven EL, Buth J, et al. A randomized trial comparing conventional and endovascular repair of abdominal aortic aneurysms. *N Engl J Med* 2004; **351:** 1607–18.
3 Lederle FA, Freischlag JA, Kyriakides TC, et al. Outcomes following endovascular vs open repair of abdominal aortic aneurysm: a randomized trial. *JAMA* 2009; **302:** 1535–42.
4 Lal BK, Zhou W, Kyriakides T, et al. Predictors and outcomes of endoleaks in the Veterans Affairs Open Versus Endovascular Repair (OVER) trial of abdominal aortic aneurysms. *J Vasc Surg* 2015; **62:** 1394–404.
5 Patel R, Sweeting MJ, Powell JT, Greenhalgh JM, for the EVAR trial investigators. Endovascular versus open repair of abdominal aortic aneurysm in 15-years' follow-up of the UK endovascular aneurysm repair trial 1 (EVAR trial 1): a randomised controlled trial. *Lancet* 2016; published online Oct 12. http://dx.doi.org/10.1016/S0140-6736(16)31135-7.
6 Verzini F, Isemia G, DeRango P, et al. Abdominal aortic endografting beyond the trials: a 15-year single-center experience comparing newer to older generation stent-grafts. *J Endovasc Ther* 2014; **21:** 439–47.
7 Desender L, Van Herzeele I, Lachat ML, et al, on behalf of the PAVLOV Study Group. Patient-specific rehearsal prior to EVAR: influence on technical and non-technical operative performance. a randomized controlled trial. *Ann Surg* 2016; published online July 15. DOI:10·1097/SLA.0000000000001871.
8 Sobocinski J, Chenorhokian H, Maurel B, et al. The benefits of EVAR planning using a 3D workstation. *Eur J Vasc Endovasc Surg* 2013; **46:** 418–23.
9 Schanzer A, Greenberg RK, Hevelone N, et al. Predictors of abdominal aortic aneurysm sac enlargement after endovascular repair. *Circulation* 2011; **123:** 2848–55.
10 Wyss TR, Brown LC, Powell JT, Greenhalgh RM. Rate and predictability of graft rupture after endovascular and open abdominal aortic aneurysm repair: data from the EVAR trials. *Ann Surg* 2010; **252:** 805–12.
11 Wyss TR, Dick F, Brown LC, Greenhalgh RM. The influence of thrombus, calcification, angulation, and tortuosity of attachment sites on the time to the first graft-related complication after endovascular aneurysms repair. *J Vasc Surg* 2011; **54:** 965–71.
12 McCulloch P, Altman DG, Campbell WB, et al. No surgical innovation without evaluation: the IDEAL recommendations. *Lancet* 2009; **374:** 1105–12.

eTHoS piles pressure on haemorrhoidopexy


Dr P Marazzi/Science Photo Library

Published Online October 7, 2016 http://dx.doi.org/10.1016/S0140-6736(16)31802-5
See Articles page 2375

Surgical innovation strives to address the perceived shortcomings and potential pitfalls associated with traditional therapeutic techniques. New devices are often recommended to patients on the basis of incomplete clinical datasets that highlight specific short-term gains over standard treatment but may not confirm long-term benefit. Enthusiasm for new technology in surgery should be balanced by the requirement to undertake objective, high-quality studies to establish the overall clinical and economic effect of surgical therapies.[1]

In *The Lancet*, Angus Watson and colleagues present eTHoS,[2] a randomised, non-blinded, multicentre, phase 3 study assessing clinical outcomes and cost-effectiveness for treatment of moderate or severe haemorrhoids using novel stapled haemorrhoidopexy versus the long-established traditional excisional haemorrhoidectomy.[2] These outcomes are of importance as each year millions of people are affected by haemorrhoids worldwide;[3] the UK National Health Service carries out in excess of 20 000 haemorrhoidal treatments.[4]

Traditional haemorrhoidectomy excises symptomatic tissue from the anal canal leaving wounds that usually take 6 weeks to heal.[5] Surgeons often contend that traditional haemorrhoidectomy is a good treatment for haemorrhoids, the axiom of "6 weeks' pain for 5 years' gain" has long been touted, although surprisingly little high-quality evidence exists to support this position.[6] Patients experience short-term discomfort after traditional haemorrhoidectomy until their anal canal wounds heal, and, if severe, this pain might give rise to additional problems such as a fear of evacuation, constipation, and an inability to pass urine requiring catheterisation.

Stapled haemorrhoidopexy was specifically developed to tackle the problem of early pain after traditional haemorrhoidectomy.[7] A ring of tissue is excised from the relatively insensate, viscerally innervated upper anal canal, with the cut edges simultaneously brought together and fixed by a circle of staples. Traction draws the prolapsing haemorrhoids into the anal canal where they remain fixed (pexy). Stapling might also interrupt the submucosal blood flow to haemorrhoids, thereby reducing symptoms of bleeding. Initial experience reinforced the view that stapled haemorrhoidopexy was less painful for patients than traditional haemorrhoidectomy, however, severe