



Wrong conclusion in meta-analysis

J. Rosenberg¹ · K. Andresen¹

Received: 14 January 2020 / Accepted: 18 February 2020 / Published online: 2 March 2020
© Springer-Verlag France SAS, part of Springer Nature 2020

Dear Editor,

We read with interest the recently published meta-analysis comparing total extraperitoneal endoscopic hernioplasty (TEP) with Lichtenstein repair for inguinal hernia [1]. The conclusion that TEP results in more recurrences than Lichtenstein is, however, problematic.

The problem is, that the authors included the study by Neumayer et al. [2]. This study had a weight of 59.2% in the meta-analysis, but should not be included at all. The reason for this is that the mesh sizes for the TEP repairs were way too small, which in itself have resulted in more recurrences in the TEP group. The mean mesh sizes for the TEP repairs were only around 8 cm in vertical dimension [3], meaning that many must have been even smaller than 8 cm, and this is smaller than the mesh sizes recommended in the current World Guidelines for inguinal hernia repair [4]. It has been shown, that mesh size should be at least 10 × 15 cm, otherwise recurrence rates will increase [4].

The authors stated in the meta-analysis [1] that they performed a sensitivity analysis and that these analyses did not reveal any discrepancies. We would like to see the results of these analyses and have therefore conducted them ourselves, based on the data presented in the review [1]. A sensitivity analysis without the study by Neumayer et al. shows no difference in recurrence rates between TEP and Lichtenstein

(Fig. 1). Furthermore, when performing the analysis with a random effects model (which would be appropriate given the differences in study design), there is also no difference in recurrence rates (Fig. 2).

When performing a meta-analysis, it is important to consider the data entered and quality of the studies. Heterogeneity is an important assumption when conducting a meta-analysis. First, is there clinical and methodological homogeneity between the studies and secondly is there statistical homogeneity? Statistical heterogeneity is measured by the I^2 value in the analysis. Cochrane Handbook provides intervals for I^2 values; “50–90%: may represent substantial heterogeneity”. In the meta-analysis regarding recurrence, the I^2 value is 63%, and this should prompt authors to investigate reasons for heterogeneity [5]. Furthermore, we will encourage all authors to use the newly updated Cochrane Handbook [5].

We find the presented analysis to be misleading and believe that the conclusion based on the available data should be that there is no difference in the recurrence rates between TEP and Lichtenstein repair.

✉ J. Rosenberg
Jacob.rosenberg@regionh.dk

¹ Cochrane Colorectal Group, Herlev, Denmark

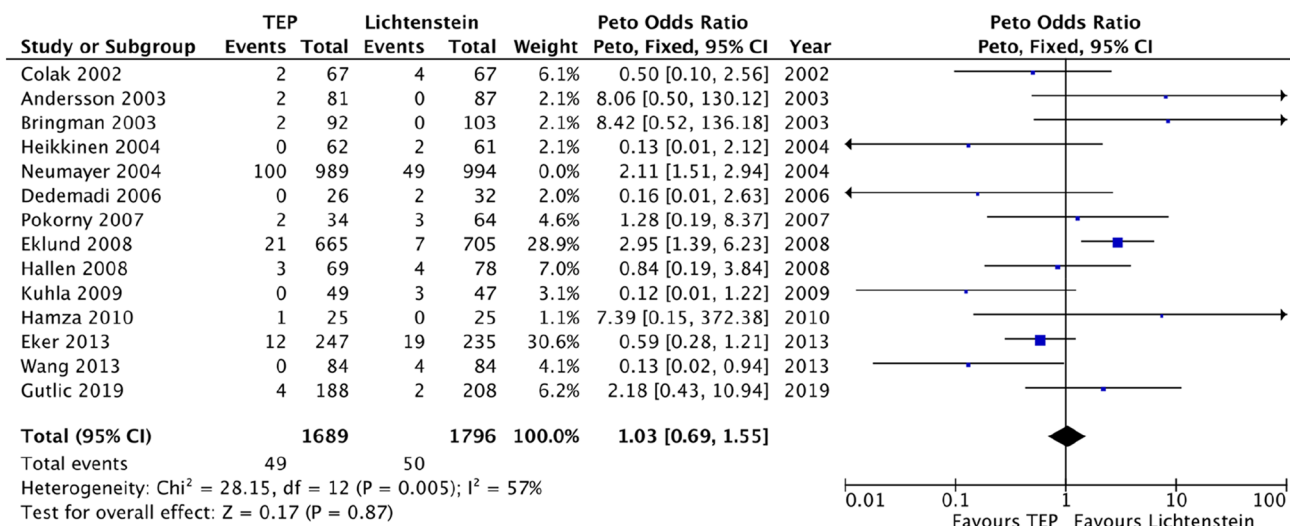


Fig. 1 Meta-analysis without including Neumayer et al. [2]

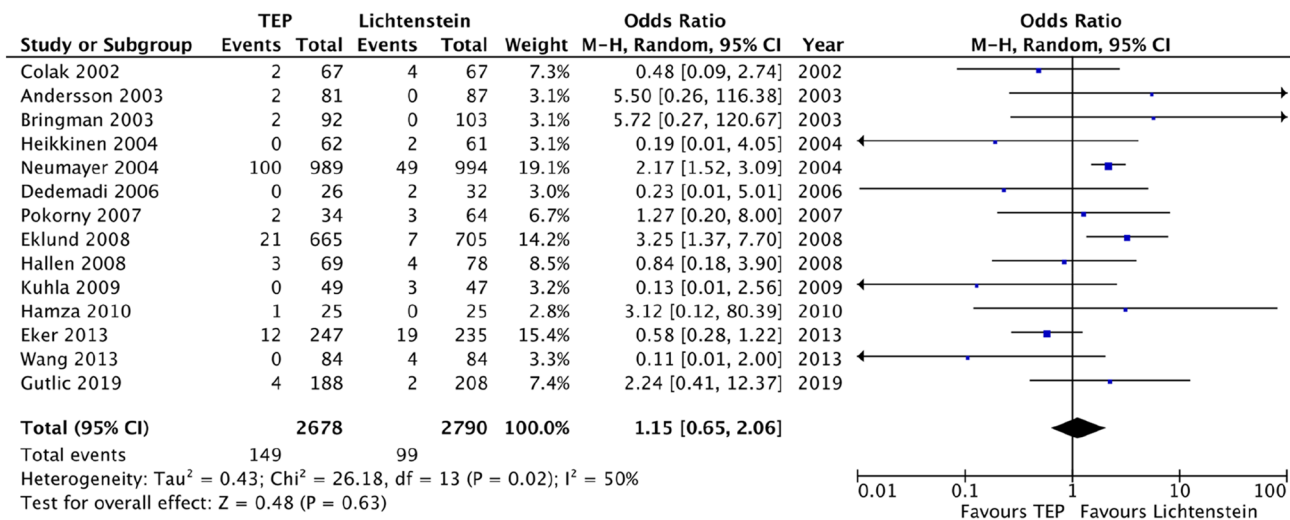


Fig. 2 Meta-analysis including all studies, but with a random effects model

Compliance with ethical standards

Conflict of interest Authors declare that they have no conflict of interest.

Ethical approval For this type of study ethical approval is not required.

Human and animal rights This article does not contain any studies with human participants or animals performed by any of the authors.

Informed consent For this type of study formal consent is not required.

References

- Gavriilidis P, Davies RJ, Wheeler J, de' Angelis N, Di Saverio S (2019) Total extraperitoneal endoscopic hernioplasty (TEP) versus Lichtenstein hernioplasty: a systematic review by updated traditional and cumulative meta-analysis of randomized-controlled trials. *Hernia* 23:1093–1103
- Neumayer L, Giobbie-Hurder A, Jonasson O, Fitzgibbons R Jr, Dunlop D, Gibbs J, Reda D, Henderson W (2004) Open mesh versus laparoscopic mesh repair of inguinal hernia. *N Engl J Med* 350:1819–1827
- Strate T, Mann O, Izbicki JR (2004) Open mesh versus laparoscopic mesh hernia repair. *N Engl J Med* 351:1463–1465 (author reply 1463–1465)
- HerniaSurge Group (2018) International guidelines for groin hernia management. *Hernia* 22:1–165

5. Higgins JPT, Thomas J, Chandler J, Cumpston M, Li T, Page MJ, Welch VA (eds) (2019) Cochrane Handbook for Systematic Reviews of Interventions version 6.0 (updated July 2019). Cochrane. www.training.cochrane.org/handbook

Publisher's Note Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.