

References

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Can't See the Right Forest Plot for the Wrong Trees!

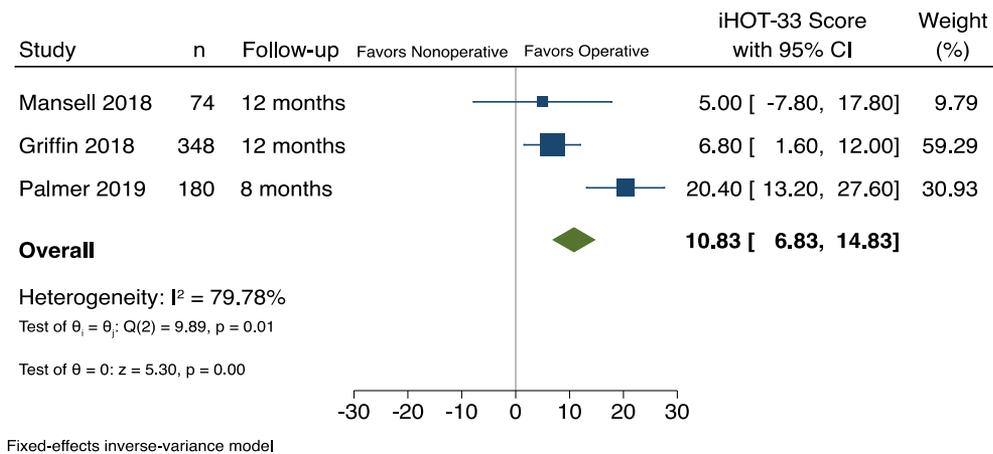
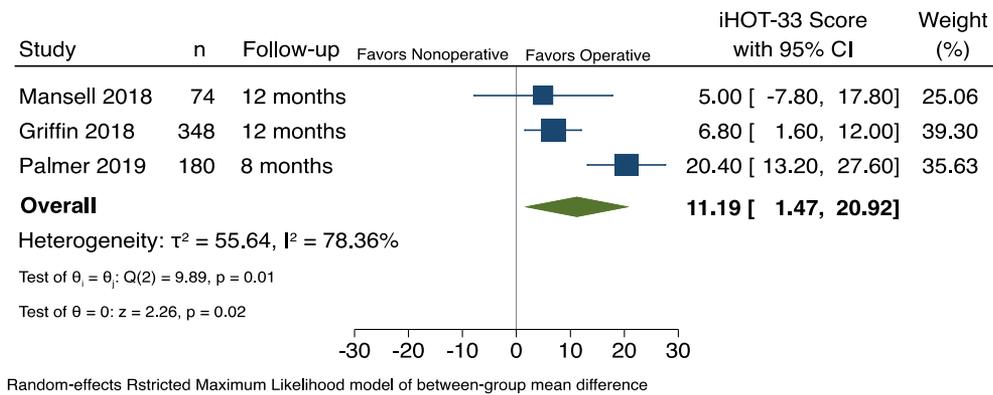


We have with great interest studied the meta-analysis and forest plot in Dwyer et al.¹ which is supposed to illustrate the effect of operative versus nonoperative treatment of femoroacetabular impingement syndrome. The meta-analysis, based on three randomized controlled trials,²⁻⁴ shows a between-group difference on the International Hip Outcome Tool-33 (iHOT-33; 0 points [worst] to 100 points [best]), favoring operative treatment (mean difference: 3.46 points; 95% confidence interval [CI] 0.07 to 6.86).

We congratulate the authors on the first meta-analysis for this very important topic, but unfortunately the forest plot presented by Dwyer et al.¹ is flawed owing to incorrect use of the iHOT-33 value derived from Palmer et al.,² published in 2019 in the *British Medical Journal* (BMJ). Dwyer et al.¹ have used the between-group difference of 2 points on the iHOT-33 reported by Palmer et al.² The iHOT-33 score is normally measured on a visual analog scale from 0 to 100 mm, where each millimeter represents 1 point.⁵ When Palmer et al.² was published, we were surprised to see that a 2-point between-group difference could yield statistical significance with only 180 subjects. We contacted the authors at BMJ Rapid Response with our concern (see <https://www.bmj.com/content/364/bmj.l185/rr-4>), who informed us that they had used a centimeter scale (0 to 10 cm) instead of the usual millimeter scale (0 to 100 mm) (see <https://www.bmj.com/content/364/bmj.l185/rr-5>). Unfortunately, this is not clear in the BMJ paper.²

Furthermore, Palmer et al.² informed us in their Rapid Response that Dwyer et al.¹ have used these incorrect values in their meta-analysis. This means that Dwyer et al.¹ unknowingly have combined different scales (0 to 10 cm and 0 to 100 mm) in their meta-analysis, mixing absolute millimeter points from 2 studies,^{3,4} with absolute centimeter points from Palmer et al.² The correct iHOT-33 value to include in the meta-analysis from Palmer et al.² should have been 20.4 points (95% CI 13.2 to 27.6), not 2 points (95% CI 1.2 to 2.8) (<https://www.bmj.com/content/364/bmj.l185/rr-5>). This has, based on what seems to be incorrect reporting using the iHOT-33 scaling by Palmer et al. in BMJ,² led to (1) an incorrect data point in the meta-analysis¹ and (2) an effect on the accompanying editorial commentary.⁶

Operative vs nonoperative treatment of femoroacetabular impingement syndrome



We have conducted a revised meta-analysis including the correct data and scale in millimeters (Fig 1). For transparency, we present both a fixed- and random-effects model, but we prefer to use the random-effects model, since the 3 studies in the meta-analysis 1) concern very different populations (military versus general population), (2) use different eligibility criteria, and (3) lack a transparent description of the nonoperative treatment and postoperative rehabilitation.⁷

Our revised analysis (random-effects model) shows a between-group difference of 11.19 points (95% CI 1.47 to 20.92) favoring operative treatment (Fig 1). We urgently encourage *Arthroscopy* to submit the relevant Errata for both meta-analysis and editorial commentary, alongside our letter to the editor, for transparency and to avoid any possible misunderstandings.

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Fig 1. Revised meta-analyses and forest plots on the effect of operative versus nonoperative treatment of femoroacetabular impingement syndrome using a random-effects restricted maximum likelihood model (upper forest plot) and a fixed-effects inverse-variance model (lower forest plot). Positive International Hip Outcome Tool-33 (iHOT-33) scores denotes an effect in favor of operative treatment.

Note: The authors report no conflicts of interest in the authorship and publication of this article. Full ICMJE author disclosure forms are available for this article online, as [supplementary material](#).

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We thank Ishoi et al. for bringing to our attention the reporting error in the article by Palmer et al.¹—one of the studies included in our meta-analysis of operative versus nonoperative outcomes for femoroacetabular impingement syndrome (FAIS).

As Ishoi et al. state, and Palmer et al. acknowledge in their BMJ Rapid Response publication,¹ the adjusted between-group treatment effect for the International Hip Outcome Tool-33 (iHOT-33) score in the original Palmer et al.¹ publication ought to read 20.4 (95% confidence interval [CI] 13.2 to 27.6) rather than 2.0 (95% CI 1.3 to 2.8) as initially reported. We included the originally reported incorrect value in our meta-analysis to calculate the standardized mean difference in iHOT-33 scores across studies. This resulted in a falsely diminished difference in our primary outcome comparing operative and nonoperative treatments for patients with FAIS. Given that this error was discovered after the publication of our

meta-analysis, we take this opportunity to submit our revised results and conclusions based on the insight by Ishoi et al. and the subsequent correction by Palmer et al.

When assessing for heterogeneity between the 3 included studies with the corrected results, the I^2 value exceeds 50%, indicating significant heterogeneity. Accordingly, as per our previously published methodology,² we have used a random-effects model for meta-analysis (Fig 1).

In comparison to our initial reported treatment effect, this updated meta-analysis more substantially favors operative management over nonoperative management for FAIS. The mean difference of 11.7 exceeds the minimally clinically important difference for the iHOT-33,³ indicating a clinically significant difference in operatively treated patients over the nonoperative group at a mean follow-up of 10 months.

We thank Ishoi et al. for pointing out this change.

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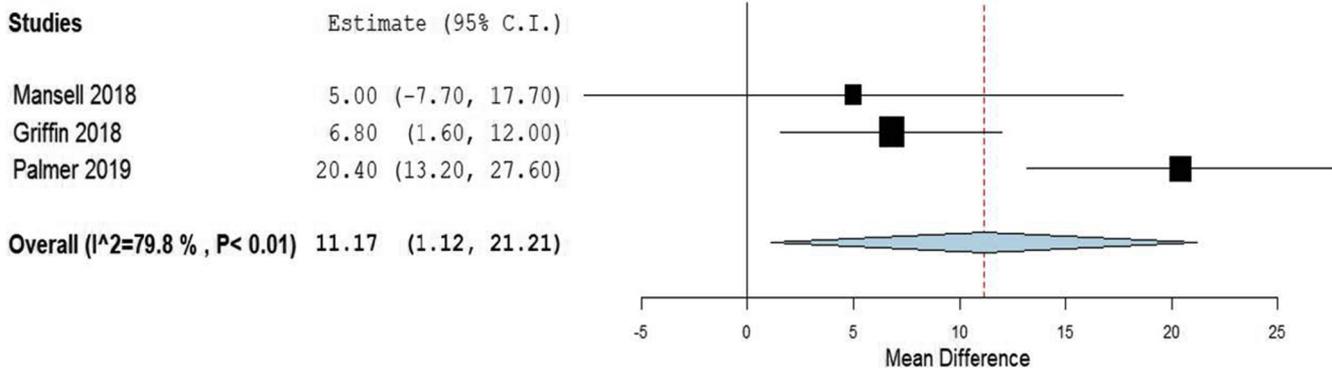


Figure 1. Revised random-effects meta-analysis of postoperative iHOT-33 scores comparing operative versus nonoperative treatment of femoroacetabular impingement syndrome.