

Meta-analysis of Closed Incision Negative Pressure Therapy Versus Standard of Care Over Knee And Hip Arthroplasty Closed Surgical Incisions in the Prevention of Surgical Site Complications

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Background

- Closed incision negative pressure therapy (ciNPT)* with foam dressings is an effective method of managing and protecting the postoperative surgical site.
- Previous meta-analyses have shown that ciNPT can be beneficial after orthopedic surgery, including total joint arthroplasty.¹⁻³

Purpose

- This systemic review and meta-analysis examines the impact of ciNPT on the risk of surgical site complications (SSC) following knee and hip arthroplasty.

Methods

- A systemic literature search was performed in PubMed, EMBASE, and QUOSA for publications comparing ciNPT to traditional standard of care (SOC) dressings between January 2005 and July 2021.
- The search identified 972 publications. After removal of duplicates and studies that did not meet the inclusion criteria, 12 were specific to knee and/or hip arthroplasties.
- Analyses were performed by calculating weighted risk ratios. Treatment effects were combined, and a random effects model was used for each analysis.

Results

- Eight studies were included in the evaluation of SSCs, where a significant difference was seen in favor of ciNPT (relative risk [RR] 0.332, p<0.001; **Figure 1**).

Results (Cont’d)

- Significant benefits in favor of ciNPT were also seen in the analysis of surgical site infection (RR 0.401, p=0.016; **Figure 2**), seroma (RR 0.473, p=0.008; **Figure 3**), dehiscence (RR 0.380, p=0.014; **Figure 4**), and prolonged incisional drainage (RR 0.399, p=0.003; **Figure 5**).
- Only two studies reported on hematomas, for which there was no difference between ciNPT and SOC (RR 0.339, p=0.335).
- In addition to SSCs, health economic endpoints were also evaluated. There was significant reduction in the rate of return to the operating room (RR 0.418, p=0.001; **Figure 6**).

Conclusions

- For this meta-analysis, the use of ciNPT after knee and hip arthroplasty was associated with a significantly reduced risk of overall SSC, including surgical site infections, seroma, dehiscence, and prolonged incisional drainage.
- The risk of returning to the hospital for reoperation was also reduced, suggesting a potential for both economic and clinical advantages for ciNPT over SOC dressings.

References

- Kim JH, Kim HJ, Lee DH. *J Arthroplasty*. 2019;34(11):2804-2814.
- Ailaney N, Johns WL, Golladay GJ, et al. *J Arthroplasty*. 2021;36(7):2402-2411.
- Kim JH, Lee DH. *Int Wound J*. 2020;17(5):1310-1322.

Figures

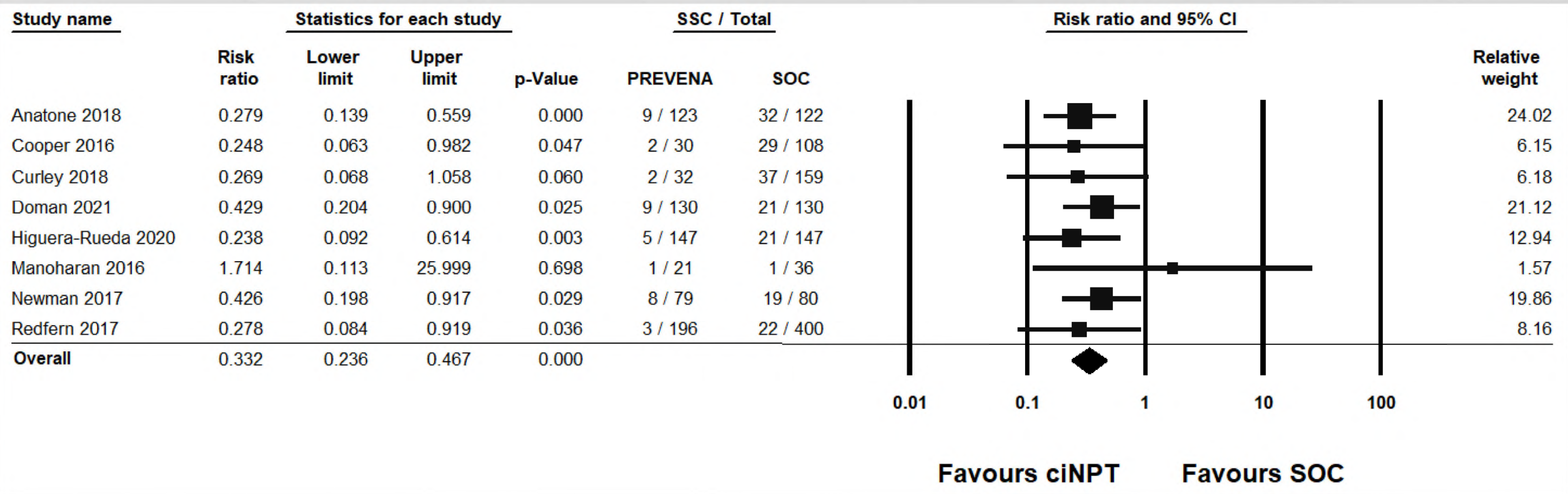


Figure 1. Surgical site complication forest plot. Each study is displayed with the risk ratio, upper and lower limit, and relative weight.

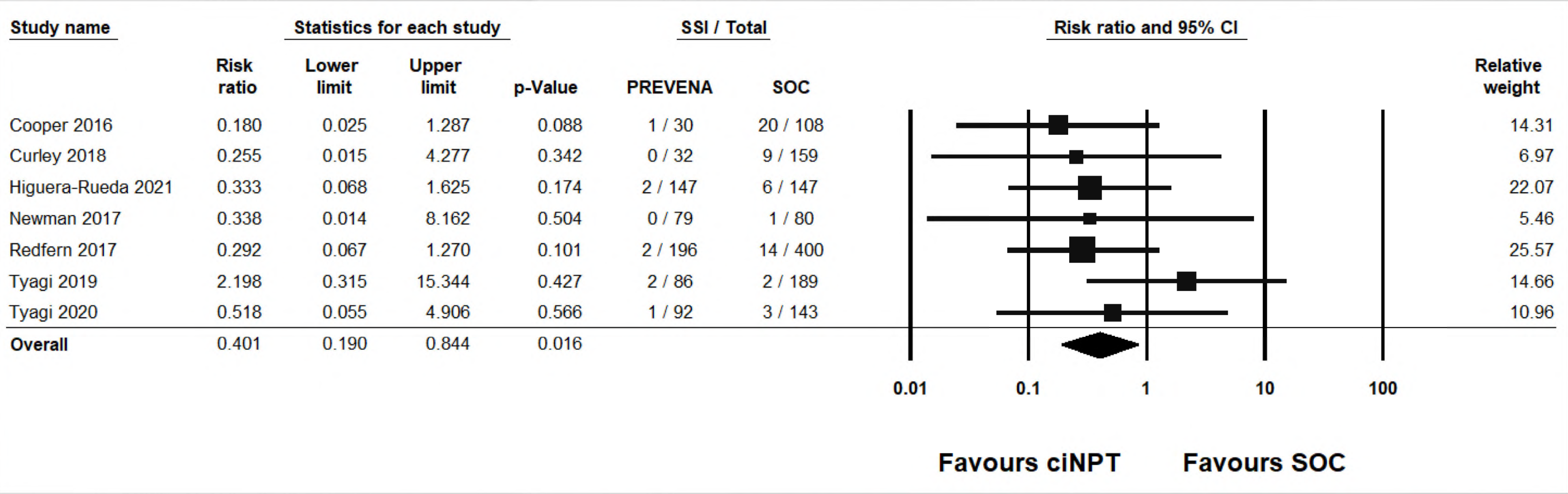


Figure 2. Surgical site infection forest plot. Each study is displayed with the risk ratio, upper and lower limit, and relative weight.

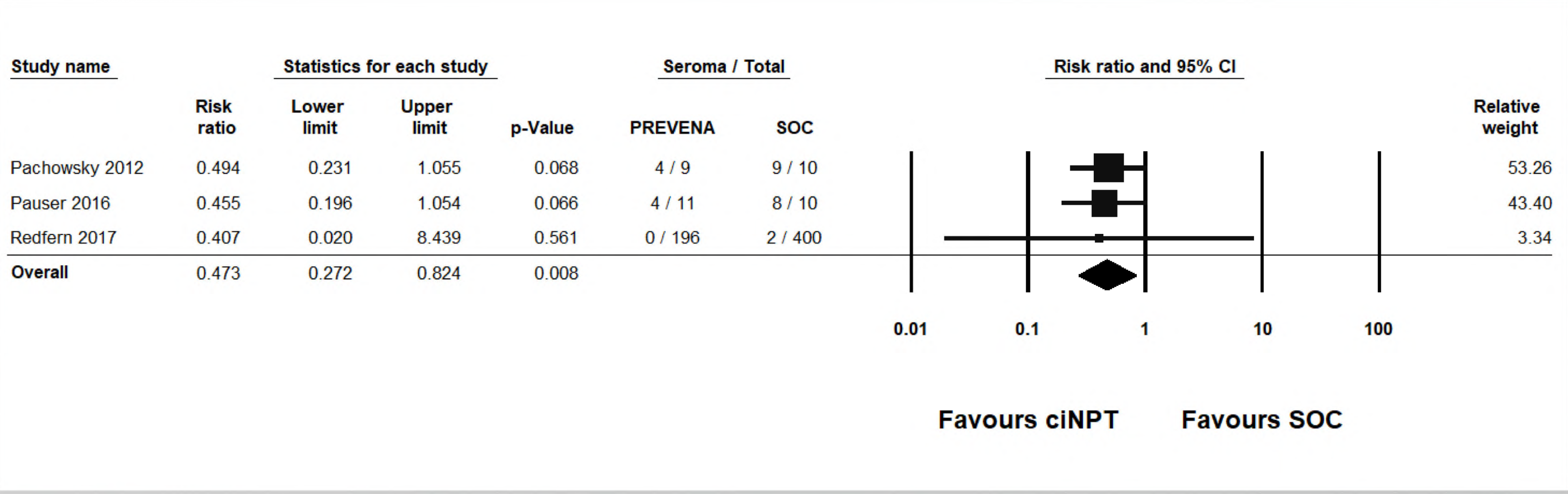


Figure 3. Seroma forest plot. Each study is displayed with the risk ratio, upper and lower limit, and relative weight.

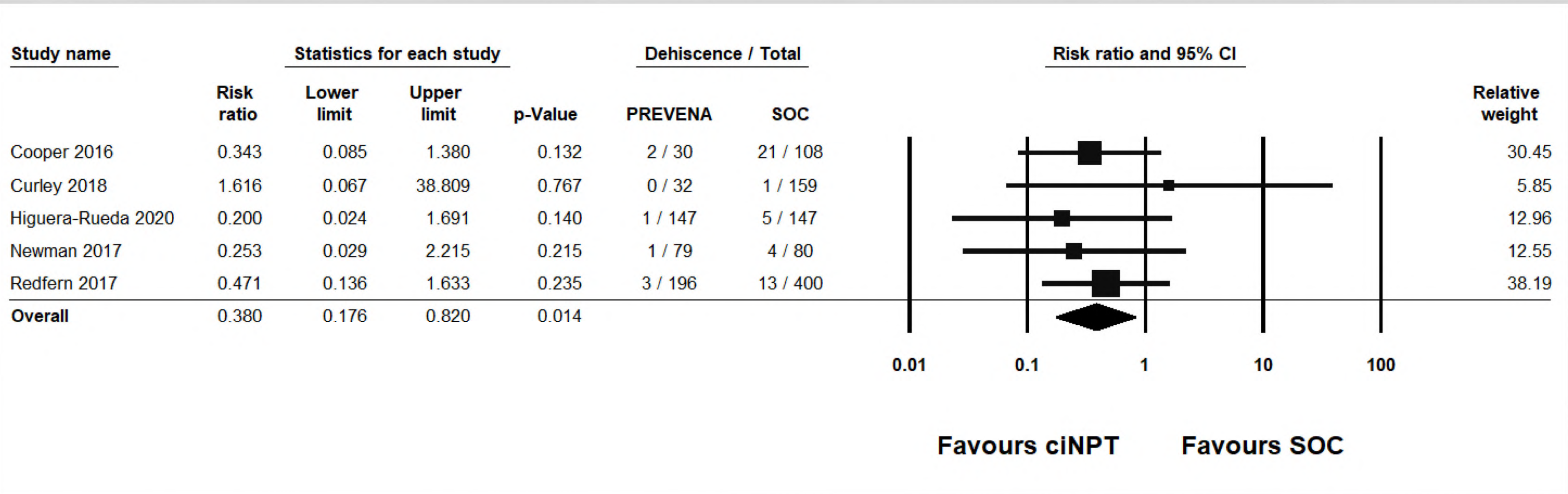


Figure 4. Dehiscence forest plot. Each study is displayed with the risk ratio, upper and lower limit, and relative weight.

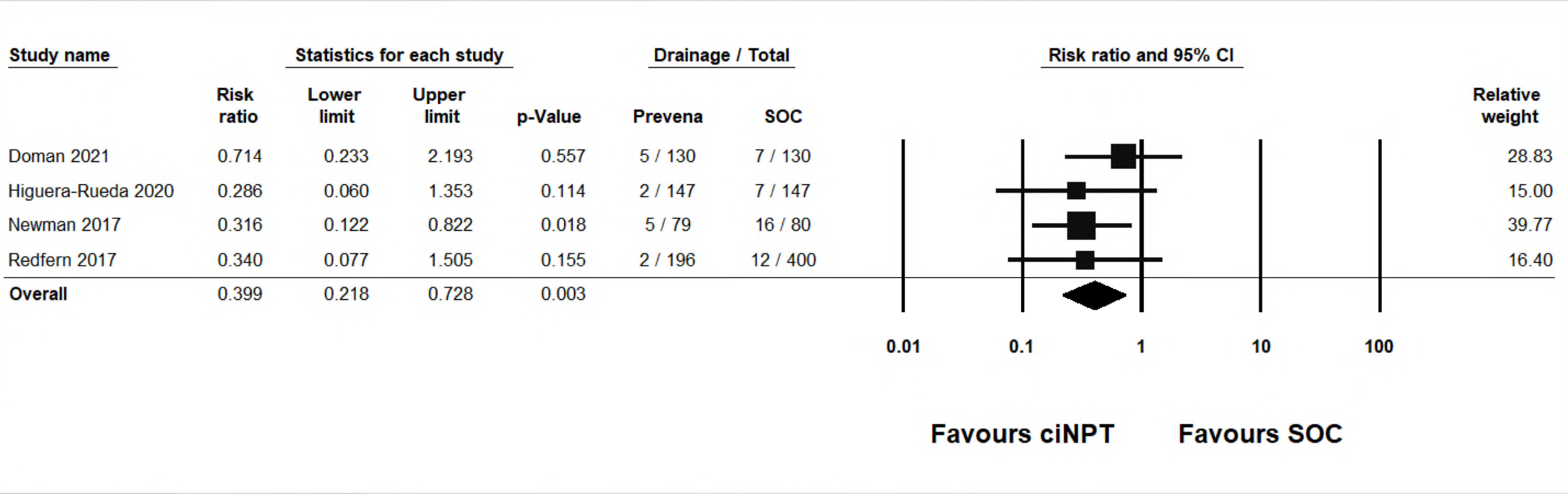


Figure 5. Prolonged incisional drainage forest plot. Each study is displayed with the risk ratio, upper and lower limit, and relative weight.

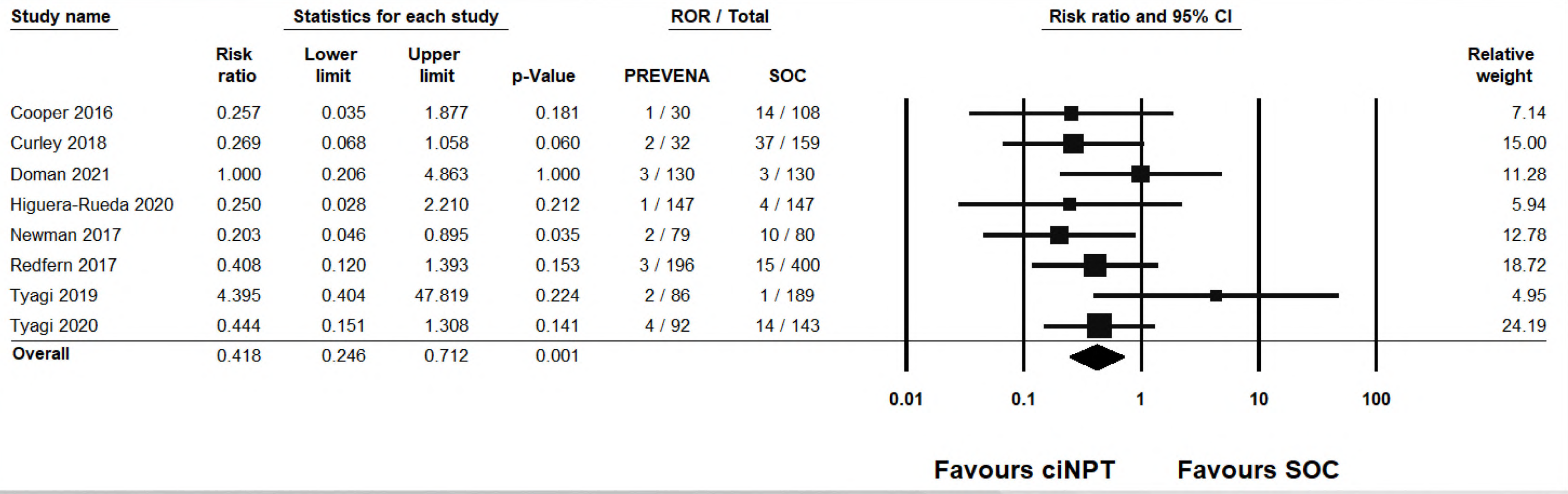


Figure 6. Rate of return to the operating room forest plot. Each study is displayed with the risk ratio, upper and lower limit, and relative weight.