

Is there a role for isolated femoral head and liner exchange in patients with instability of the hip?

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Response/Recommendation:

Although isolated femoral head and liner exchange has been employed to treat hip instability following total hip arthroplasty, this procedure carries a notable prevalence of persistent dislocation (15.4%) and re-revision (16.9%). Thus, we recommend that this surgical option be used only in select circumstances and when the acetabular component malpositioning is not the culprit for instability.

Level of Evidence: Moderate

Rationale:

We conducted a systematic review to retrieve all articles related to femoral head and liner exchange for treatment of recurrent instability after Total Hip Arthroplasty (THA). After screening the retrieved articles and abstracts, nine articles were included for the final analyses and review [1-9](Table 1). Studies specifically addressing hip revisions with constrained, bipolar, or dual-mobility bearings were excluded from the review. The reviewed articles, published between 2004 and 2024, were predominantly conducted in the USA, with three additional studies from Australia and Taiwan. The prevalence of postoperative dislocation and re-revision in these patients was analyzed through proportion analysis, employing the inverse variance method, utilizing R software. Egger's Regression test was used to evaluate publication bias.

In the nine reviewed articles, all studies had at least one year of follow-up. A total of 1,594 patients who underwent isolated femoral head and liner exchange were included. Among these, 189 patients experienced redislocation (pooled prevalence [95% CI] = 15.4% [10.78 to 21.52], $I^2 = 75\%$) and 164 patients required re-revision (pooled prevalence [95% CI] = 16.9% [14.68 to 19.40], $I^2 = 32\%$). No publication bias was detected in any of these outcomes.

Six of the studies also investigated functional outcome of these patients using the Harris Hip Score, Hip Disability and Osteoarthritis Outcome Score, visual analogue scale, and similar measures. All reported significant improvements in function and reductions in pain scores following isolated femoral head and liner exchange.

Regarding factors affecting the likelihood of redislocation after revision, Robertson et al. conducted the most comprehensive investigation [5]. Their multivariate Cox regression analysis, with redislocation as the endpoint, revealed that hips with cup abduction angles greater than 48 degrees were 2.6 times more likely to dislocate ([95% CI] = 1.3 to 5.4, $P = 0.01$). No other covariates, including height, weight, gender, neck length, head diameter, cup anteversion, and revision surgical approach, were associated with an increased risk of dislocation. Other studies concurred with these findings. Also, Robertson et al. demonstrated

that hips without dislocation exhibited a larger increase in femoral head diameter compared to those with dislocation (3.5 ± 4.4 mm vs. 1.8 ± 3.4 mm, respectively, $P = 0.04$).

As a limitation of this review, it should be noted that most of the included articles examined patients with various indications for revision surgery, rather than focusing solely on instability, and did not segregate the results based on the specific indication. Consequently, the reviewed articles encompass a broader patient group beyond those with hip instability. For more precise insights, future research should focus exclusively on patients with hip instability.

References

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Figures:

Table. Baseline characteristics of reviewed articles and revision outcomes

Author, Year	Country	Total number of hips, n	Age, year	Gender (m:f)	Dislocation, n	Re-revision, n	Follow-up
Berlinberg et al. 2022	USA	7	/	/	4	/	43 (24-110) months
Biviji et al. 2009	USA	48	69.2 (51-87)	20:28	13	10	4.7 (1.2-9.4) years
Cheng et al. 2024	USA	52	71.4 ± 11.8	26:26	12	12	55.0 (24.2-85.9) months
Robertson et al. 2022	USA	248	64.9 (28-88)	123:123	30	/	2.3 ± 2.3 years
Wetters et al. 2013	USA	321	/	/	41	/	2 years
Hoskins et al. 2020	Australia	722	69.1	280:442	67	124	5.7 years
Stevenson et al. 2020	USA	141	/	/	16	15	55.8 months
Wade et al. 2004	USA	35	60.5 (28-85)	16:19	2	/	2.6 (2-3.5) years
Wang et al. 2020	Taiwan	20	61.3 (40-93)	12:8	4	3	45.7 (12-128) months