

Original Article



Functional Outcomes of Primary Total Hip Arthroplasty between Direct Anterior Approach and Posterior Approach: A Systematic Review and Meta-Analysis

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ABSTRACT

Introduction: Less-invasive approach to hip joint replacement promotes postoperative recovery and can reduce soft tissue damage and blood loss that promotes the recovery of normal daily functions. However, the incidence of complications in DAA is relatively high at the early technical learning level.

Methods: A systematic review was conducted in accordance to PRISMA guidelines through PubMed, Google Scholar, and Cochrane Library. After that, the study assessed with assessment of study quality and risk of bias assessed using criteria developed by the Oxford Center for Evidence-based Medicine.

Results: From 208 records, remaining 5 studies were included. There was a significant difference in incision length between PLA and DAA. (Mean Difference = 3.43, 95% CI 3.31 to 3.54, P <0.01). Furthermore, there was a significant difference in length of hospital stay (LOS) between PLA and DAA (Mean Difference = 0.47, 95% CI 0.37 to 0.57, P <0.01). There was also a significant difference between the two groups in terms of the 3 months post-operative HHS score (MD = -1.34, 95% CI - 2.15 to 0.52, p < 0.01) with significant difference heterogeneity (I² = 79%).

Discussion: Few studies stated that there was no significance difference for the comparison of the length of the incision between the DAA and PLA in primary THA. Also, a statistically significant difference in length of hospital stay between DAA and PLA were found. Meanwhile, several studies found that there was no significant difference between the DAA group and PA group in terms of the length of hospital stay.

Conclusion: HLA was preferable effective compared to DAA in Harris Hip Score functional outcome. However further researches with more sample size were still needed.

Keywords: total hip replacement, surgical approach, length of hospitalization

Introduction

Total Hip Arthroplasty (THA) is an effective method for treating hip diseases such as femoral neck destruction, femoral head of sterile necrosis, and arthritis and rheumatoid arthritis. [1] It eliminates the patient's hip pain and recovers the hip function and removes pain and improves the quality of life. [2] During 10 years of tracking, the

clinical efficacy of THA was significantly improved, and the survival rate of prosthesis exceeded 95%. [3]

There are two different approaches in THA, Posterolateral Approaches (PLAs) and Direct Anterior (DAA). Direct front approach is not cut away muscle tissue around the hip joint, but didn't

damage the back joint capsule, but theoretically, the risk of displacement is also theoretically. [4-6] Britain and New Zealand registration data show most of most major THA processes in PLA, and indicates that less than 5% of surgeon DAA. [7-9] Several scholars reported that PLA patients were a post-operative level creatine kinase, a marker for muscle. [10]

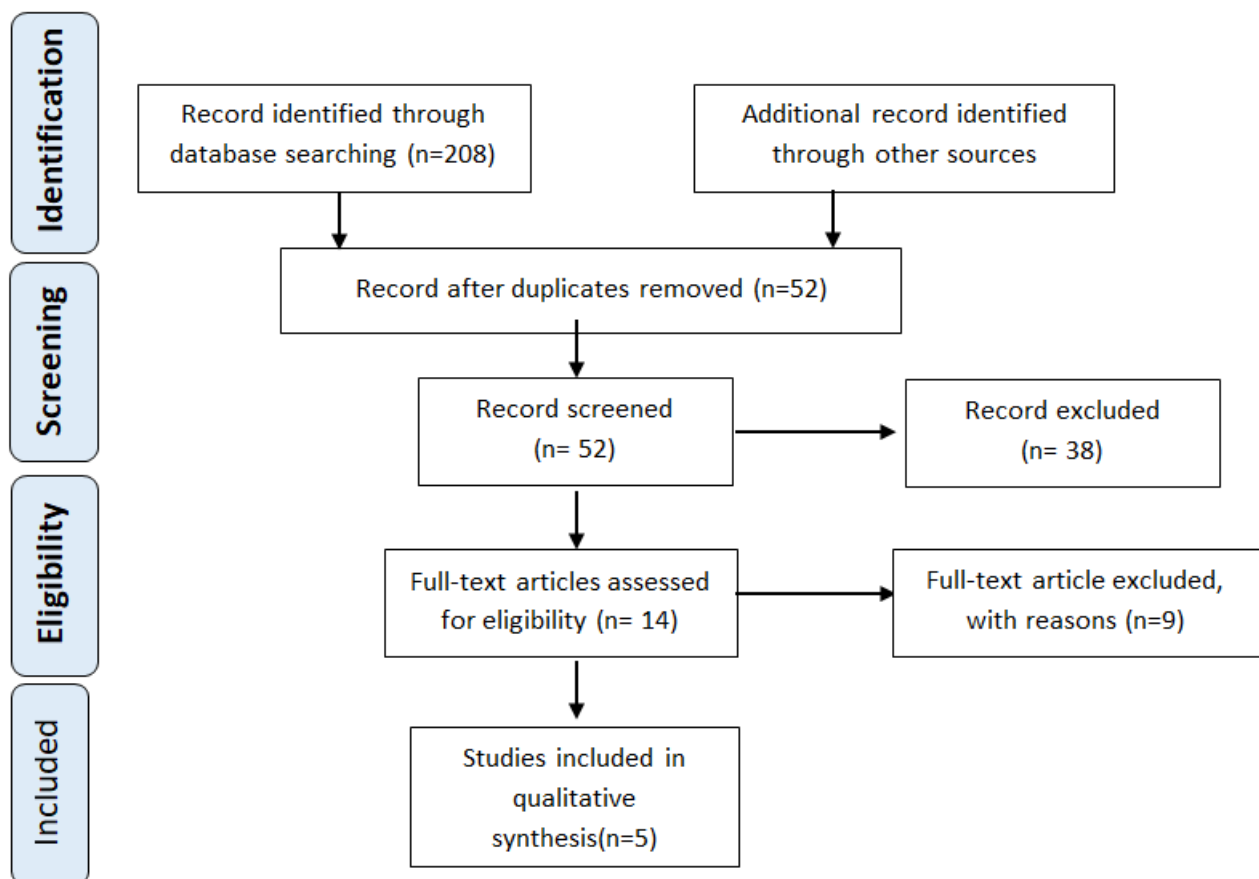
Less-invasive approach to hip joint replacement promotes postoperative recovery and can reduce soft tissue damage and blood loss that promotes the recovery of normal daily functions. [11-12] Surgeons can improve DAA based on the gap between tensor-fascial lata, sartorius, and rectus femoris. For conventional PLAs, the method of DAA has most of the bleeding, short pain period,

and most of short hip loss. [13] On the contrary, many documents revealed that two types of THA within the postoperative period have similar predictions. However, the incidence of complications in DAA is relatively high at the early technical learning level. In this study, we aimed to compare the differences between DLA and PLA [14]

Materials and Method

Search Strategy

A systematic review was conducted in accordance to Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines (Figure 1).



A comprehensive literature search was performed to gather a full-length, peer-reviewed paper in English on comparison of outcome between inpatient and outpatient in THA. We searched PubMed, Google Scholar, and Cochrane Library. The focus in this systematic review is to compare the functional outcome between anterior and posterior in total hip arthroplasty. Keywords in the search matched the MeSH rule and term used are

(“anterior approach”), AND (“posterior approach”), AND (“Total Hip Arthroplasty”), AND (“Functional Outcome”). [7]

Inclusion Criteria

The inclusion criteria were any studies except case reports, about the outpatient and inpatient undergoing Total Hip Arthroplasty. The outcome assessed using forest plot include complication.

Quality Evaluation

Assessment of study quality and risk of bias assessed using criteria developed by the Oxford Center for Evidence-based Medicine, perspicacity defined by the Grades of Recommendation Assessment, Development and Evaluation (GRADE) Working Group, and sanction made by the Agency for Healthcare Research and Quality (AHRQ).

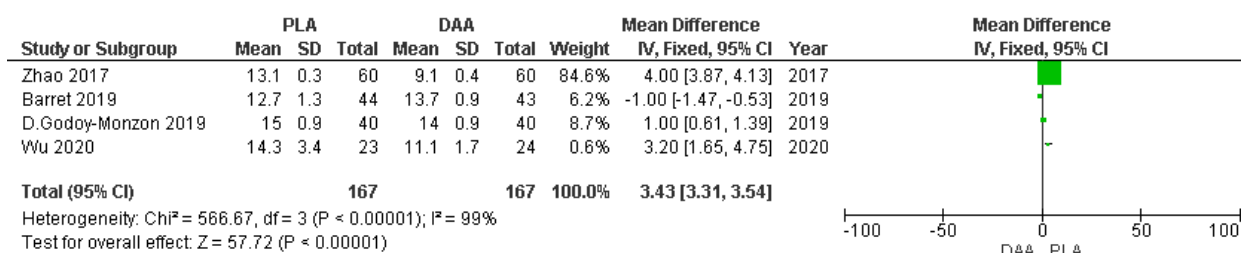
Results

Literature Search, Study Selection and Study Characteristics

The electronic research resulted in 208 records from various databases. After the process of identification, screening, eligibility, duplication elimination, and exclusion, the remaining 5 studies were included in qualitative and quantitative synthesis. The remaining articles were excluded due to lack of mean and standard deviation data and did not meet the inclusion and exclusion criteria. All studies included in the meta-analysis were randomized. High quality-controlled research. Risk bias plot for each study and summary of the risks of bias was presented

Clinical outcomes

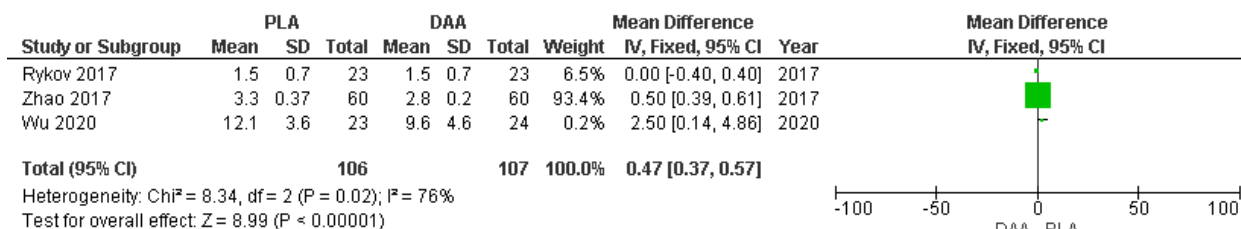
Incision Length



There was a significant difference in incision length between PLA and DAA. Four studies reported (Mean Difference = 3.43, 95% CI 3.31 to

3.54, P < 0.01)

Length of Hospital Stay

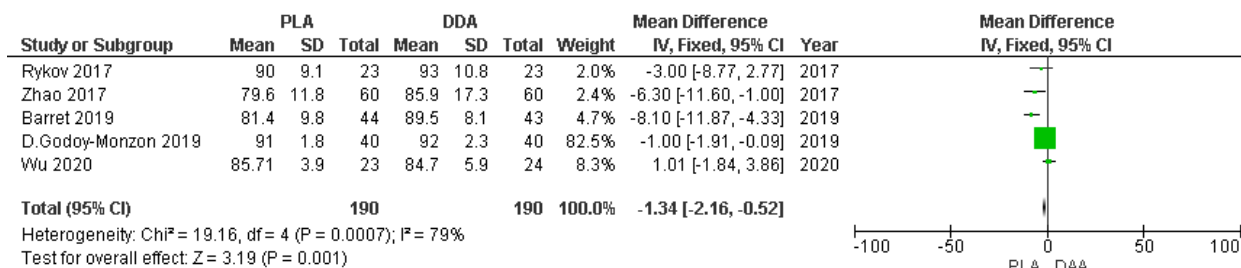


There was a significant difference in length of hospital stay between PLA and DAA. Four studies reported (Mean Difference = 0.47, 95% CI 0.37 to 0.57, P < 0.01)

between the DAA and PA in primary THA. [15-18] There was a significant difference between the two groups in terms of the 3 months post-operative HHS score (MD = -1.34, 95% CI - 2.15 to 0.52, p < 0.01). There was a significant difference heterogeneity (I² = 79%).

Harris hip score (HHS)

Five studies with a total of 380 patients were included in the comparison of the HHS score



No	Reference	Journal	Study Design	Level of Evidence
1	Rykov et al 2017	Journal of Arthroplasty	Prospective Cohort Study	II
2	Zhao et al 2017	Journal of Arthroplasty	Prospective Cohort Study	II
3	Barret et al 2019	Journal of Arthroplasty	Prospective Cohort Study	II
4	D.Godov-Monzon et al 2019	Journal of Orthopaedic Surgery and Traumatology	Prospective Cohort Study	II
5	Wu et al, 2020	European Journal of Orthopaedic Surgery & Traumatology	Retrospective Cohort Study	III

No	Reference	Total Sample Size	Treatment Protocol	
			DAA	PLA
1	Rykov et al 2017	46 patients	23	23
2	Zhao et al 2017	120 patients	60	60
3	Barret et al 2019	87 patients	44	43
4	D.Godov-Monzon et al 2019	80 patients	40	40
5	Wu et al, 2020	47 patients	23	24

Discussions

In this study, we found a difference in length of incision between DAA and PLA. Few studies stated that there was no significance difference for the comparison of the length of the incision between the DAA and PLA in primary THA. [10-11] Other studies also concluded that DAA required a significantly longer surgery duration. [13]

We found a statistically significant difference in length of hospital stay between DAA and PLA. Several studies found that there was no significant difference between the DAA group and PA group in terms of the LOS. [14]

Few studies stated that there was no significance difference for the comparison of the length of the incision between the DAA and PA in primary THA another study also concluded that DAA required a significantly longer surgery duration. Several studies found that there was no significant difference between the DAA group and PA group in terms of the LOS. There's a statistically significant differences in harris-hip score between DAA and PLA.

Most literature has a high risk of bias. Therefore, subjective impressions can affect the results.

There is a bias in this study. However, the degree of bias. It's just been developed in recent years, so it's not used much.

Conclusions

HLA was preferable effective compared to DAA in Haris Hip Score functional outcome. However further researches with more sample size were still needed.

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