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Dual Mobility Head in Total Hip Replacement for Instability: A Systematic Review

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ABSTRACT

Instability after complete hip arthroplasty (THA) is a common and worrisome problem which necessitates a comprehensive assessment and preoperative preparation prior to surgery. The management of an unstable THA is difficult even for an accomplished joints surgeon, so prevention by optimal index surgery is critical. Consequently, a potential option in total hip arthroplasty (THA) has been the dual mobility (DM) cups. Literature search was carried out using PubMed, Medline, Embase, Scopus and Cochrane Library for the studies existing till February 2021. Search was conducted by two independent reviewers separately keeping in view the structured format of the review. Data was thoroughly read through and were extracted manually on to a structured data extraction form. A total of 352 studies were identified through literature search, after removing duplicates. 71 articles were screened by two independent reviewers. A total of 18 studies were included in the final qualitative synthesis. Among these 18 studies, 9 studies were designed as prospective comparative studies while 9 studies were retrospective comparative studies. A total of 2859 total THAs (Total hip arthoplasties) with DMC (dual-mobility acetabular cup design) were studied. Sample size from all the studies collectively ranged from 16 to 653 in the DMC treated groups with patients mean age ranging from 48.5 years to 78 years which illustrated that all these studies predominantly included elderly population. The rate of dislocation in DMC treated cohorts varied between 0% and 3.8%. No case of dislocation was observed in 6 included studies. The dislocation rate risk ratio in primary THA cases, were observed to have significantly low risk of revision. According to the available data, this systematic analysis supports the usefulness of dual-mobility cup implants in minimizing postoperative dislocations and instability in patients undergoing total hip arthoplasties.

Key words: Dual-mobility, Total hip replacement, Prospective, Retrospective, Primary, Revision, Systematic review

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INTRODUCTION

Total hip arthroplasty (THA) is one of the most flourishing surgical procedure for improving patient quality of life by reducing pain and improving function. The demand for THA will expand as healthcare evolves and life expectancy increases. The number of THAs performed in the United States is projected to increase by 174 percent by 2030, due to rising demand [1]. Total hip arthroplasty procedures on the other hand, are not without danger. Instability following complete hip arthroplasty is a debilitating situation that continues to be the leading cause of revision THA in the United States, accounting for 22.5 percent of all revisions [2].

Instability after complete hip arthroplasty (THA) is a common and worrisome problem which necessitates a comprehensive assessment and preoperative preparation prior to surgery. Cases of unstable THA seems to be managed with difficulty even by accomplished surgeons, so prevention by optimal index surgery is critical. Consequently, a potential option in total hip arthroplasty (THA) has been the dual mobility (DM) cups/ bearing. The concept of dual mobility cups has been around for more than 40 years; Early in 1974, two researchers namely Gilles Bousquet and Andrè Rambert for the first time introduced the idea of dual mobility (DM) in France to combat the possibility of instability [3]. However, it was only in 2009 that United States approved its clinical use [4].

The foundational concepts, which involves principles of low friction were first explained by Sir John Charnley, are combined in dual-mobility cups with the theory explained by McKee and Farrar, based on the large head concept. Low friction principle is described as the polyethylene liner fixed onto the femoral head which is further articulated in an acetabular shell. This double articulating system with a high head-to-neck ratio results in greater joint stability [5,6].

Among the foremost causes of readmission and revision surgery after THA, instability is the most important one. Instability after THA is caused by a variety of factors that can be patient dependent or linked surgical procedures, approaches, and other related variables [7,8]. Dual mobility acetabular components have lately drawn increased interest as an alternative method for preventing and treating instability in THA. They offer improved stability without affecting clinical results or implant lifetime. Whereas on the other hand, this prosthetic design may have several disadvantages, including higher implant costs relative to traditional arthroplasty implants [9], increased wear due to the extra articulation, and lastly increased incidence of fractures due to its complex design.

Therefore, in turn to evaluate and study the role and efficacy of Dual mobility cups in total hip arthoplasties, this systematic review and meta-analysis aimed to investigate the prospective and retrospective studies on primary and revision THAs, regarding the actual efficacy and dislocation rates of this implant design.

MATERIAL AND METHODS

The present systematic review was carried out in agreement with the guidelines framed by Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA).

Literature search

In the present systematic literature review, search was performed using PubMed, Medline, Embase, Scopus and Cochrane Library for the studies existing till February 2021.

Intervention

All those studies which included the terms “total hip replacement”, “total hip arthroplasty”, “dual mobility”, “revision” “hip socket”.

Study design

This systematic review comprised of all types of RCT studies, observational studies including patients who underwent total hip arthroplasty, case reports including primary surgery or/and revision surgery which primarily focused on the efficacy of the above stated interventions.

Inclusion criteria

- In this review we included all published studies from last 10 years i.e., ranging from year 2011 to year 2021 (search was conducted on 18/4/2021).
- Studies in English language and academic peer-reviewed journals were included.
- Studies that included dislocation rates primarily, success rates, complications and the final clinical outcome after the intervention surgery were included in this systematic review.

Exclusion criteria

- Studies those were published in language other than English.
- Studies that utilized techniques other than the desired one were excluded.
- Studies including case series or reports, and articles based on basic science were also excluded from this review.

Outcome measurements

- Dislocation rates.
- Implant success.
- Complications.

Search strategy

The details of the search strategy are provided as follows:

Process of screening and selection of articles

All the published research articles, meeting our inclusion and exclusion criteria were assessed.

The selected entire articles were reviewed and screened by the two independent researchers. Additionally for all the selected articles, bibliographies were also thoroughly scanned.

Through this we intended to obtain some further research sources which were not detected during the initial research.

Hence after a final view from both the researchers a mutual consent was obtained.

According to the evidence published in the literature, a minimum follow-up of not less than 6 months was accepted, as it has been seen that most dislocations ranging between 50–70%, usually occur during the first six months after the surgery.

Ethical clearance from the institutional ethical committee was not required as all the obtained data was extracted from studies which had already been published earlier. We did not receive any outside funding for the execution of this study.

A “PRISMA flow chart” has been presented in figure 1 which evidently represents the screening process in the present review (Figure 1).

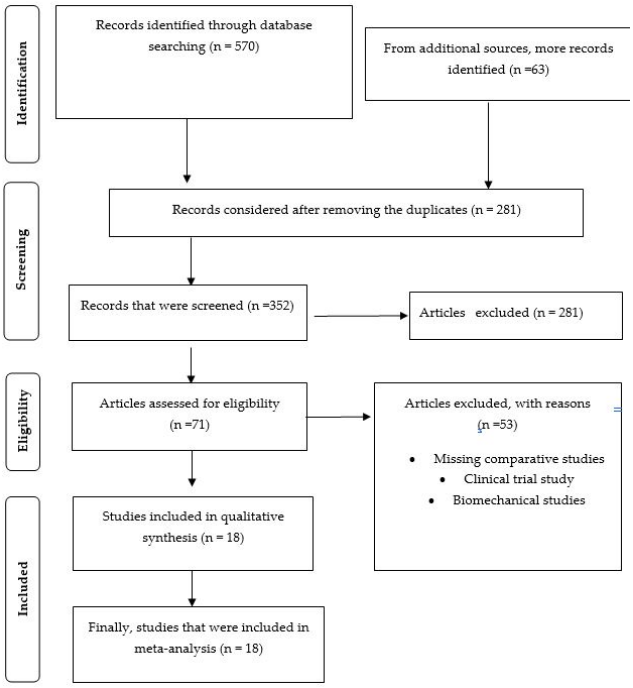

Figure 1: PRISMA Flowchart representing the screening process of the included studies.

Data extraction

The data was carefully read and manually extracted from the included studies onto a standardized data extraction method.

The following information was gathered: Basic demographics (average age, gender), etiology, type of intervention used, (Tables 1 and Table 2) surgical complications, post operative complications, and follow-ups and patient-related outcomes (Table 3).

Table 1: Demographic details.

S.no	Author	Year	Sample size (DMC cohort)	Design	Primary Vs. Revision	Mean age	Male and Female	Side effected
1.	Bouchet R et al [10]	2011	105	Prospective Comparative Study	Primary	76.6 years	Women :60 Men:45	NM
2.	Hailer NP et al [11]	2012	228	Retrospective study	Revision	NM	NM	NM
3.	Tarasevicius S et al [12]	2013	41	Prospective Comparative Study	Primary	-NM	Male:9 Female:32	NM
4.	Heumen MV et al [13]	2014	50	Retrospective Cohort Study	Revision	67 years	Male:10 Female:39	NM
5.	Caton JH et al [14]	2014	215	Prospective Comparative Study	Primary	78.0 years	Women:58.9% Men:41.1%	NM
6.	Jakobsen T et al [15]	2014	56	Retrospective stuyd	Revision	72 years	Male:29 Female:27	NM
7.	Vigdorchik JM et al [16]	2015	485	Prospective study	Primary	67 years	Female:46% Men :54%	NM
8.	Carulli C et al [17]	2016	31	Retrospective study	Revision	75.4 years	Female:18 Male:13	Right side: 17 cases; Left side: 14 cases
9.	Jauregui JJ et al [18]	2016	60	Retrospective study	Revision	57 years	Men:26 Women:34	NM
10.	Hernigou P et al [19]	2016	85	Prospective Comparative Study	Primary	74.7 years	Men:53 Women:89	NM
11.	Gonzalez AI et al [20]	2017	150	Prospective Comparative Study	Revision	73.11 years	Women:84 Men: 66	NM
12.	Hernigou P et al [21]	2017	35	Prospective Comparative Study	Primary	74.7 years	Men :15 Women: 20	NM
13.	Rowan FE et al [22]	2017	136	Prospective Comparative Study	Primary	48.5 years	Men:68 Women:68	Left 47%

14.	Harwin SF et al [23]	2018	85	Prospective Comparative Study	Revision	67 years	Men:43 Women:42	NM
15.	Cypres A et al [24]	2019	244	Retrospective study	Primary	NM	Male:56.7% Female:43.3%	Left:45.5% Right: 54.5%
16.	Huten D et al [25]	2019	653	Retrospective study	Primary	NM	NM	NM
17.	Assi C et al [26]	2019	16	Retrospective Comparative Study	Revision	69.2 years	Male:3 Female:13	NM
18.	Schmidt A et al [27]	2020	184	Retrospective Comparative Study	Revision	69 years	Men:79 Women :105	NM

*NM: Not mentioned

Table 2: Etiological profile and follow up.

S.no	Author	Reason for surgery (Etiology)	Surgical approach	Follow up
1.	Bouchet R et al [10]	Osteoarthritis (90.5%)	Posterolateral Approach.	Minimum of 1 year
2.	Hailer NP et al [11]	Primary osteoarthritis primarily, Fracture Inflammtory arthritis	Posterior Mainly and Direct Lateral	Median of 2 years
3.	Tarasevicius S et al [12]		Posterior Approach	Min 1 year
4.	Heumen MV et al [13]	Osteoarthritis Primarily Congenital Hip Dysplasia With Secondary Osteoarthritis Medial Collum Fracture Femoral Head Necrosis	Posterolateral Approach	Median of 29 months
5.	Caton JH et al [14]	Osteoarthritis (90.4%)	Posterolateral Approach	Min of 10 years
6.	Jakobsen T et al [15]			Mean of 44 months
7.	Vigdorchik JM et al [16]	Osteoarthritis Inflammatory Arthritis Post-Traumatic Arthritis Developmental Dysplasia Avascular Necrosis	Posterior Approach	Minimum of 2 years
8.	Carulli C et al [17]	NM	Lateral Approach	Mean 3.8 yrs
9.	Jauregui JJ et al [18]	NM	Posterior approach	30 months
10.	Hernigou P et al [19]	Primarily osteoarthritis	Posterior approach	Min of 14 years
11.	Gonzalez AI et al [20]	Primarily osteoarthritis	Posterior approach Mainly	Mean 31 months
12.	Hernigou P et al [21]	Primarily osteoarthritis	Posterolateral Approach	5 years
13.	Rowan FE et al [22]	NM	Posterolateral Approach	3.2 years
14.	Harwin SF et al [23]	Recurrent Dislocation Osteolysis Loose Cup Polyethylene Wear	NM	Median of 4 years
15.	Cypres A et al [24]	Primarily osteoarthritis (85.7%)	Posterior approach Mailnly	11.9 years
16.	Huten D et al [25]	Chronic dislocation with acetabular or bipolar loosening	NM	3.6 months

		Trochanteric non-union		
17.	Assi C et al [26]	Aseptic loosening	Posterolateral Approach	74.2 ± 47.9 months.
		Infection		
18.	Schmidt A et al [27]	Acetabular revisions or bipolar (femur and aetabular) revisions due to	Posterolateral Approach	1 year minimum follow-up
		Instability		
		Aseptic loosening		
		Fracture		
		Unexplained pain		
		*NM: Not mentioned		

Table 3: Complications and outcome in terms of rate of dislocation.

S.no	Author	Surgical complications	Postoperative complications	DVT	Infection	Fracture	Aseptic loosening	Rate of disslocation
1.	Bouchet R et al [10]	No	No	No	No	No	No	0
2.	Hailer NP et al [11]	No	yes	No	2%	1.50%	2%	2%
3.	Tarasevicius S et al [12]	No	yes	No	Pain	No	No	Very low
4.	Heumen MV et al [13]	No	3 patients required wound debribrment and antibiotic treatment due to prolonged effusion of the wound		2 cases Require a re-revisio due to postoperative joint infection	No	1	0
			Sciatic nerve palsy.					
5.	Caton JH et al [14]	No	No	No	No	No	2 patients needed revision surgery for aseptic loosening	0.90%
6.	Jakobsen T et al [15]	No	No	No	No	No	3 cases of re-revisoion Due to aseptic loosening of the acetabular component	1.80%
7.	Vigdorchik JM et al [16]	No	Minimal to none 3 revision surgeries (0.6%)	1	One patient underwent revision of the stem for a painful THA	1 Femur fracture (Periprosthetic fracture)	No	0
			Two patients underwent revision surgery for a metal reaction from corrosion at a modular stem-neck junction					
8.	Carulli C et al [17]	No intraoperative complication	19.30%	3	1 case UTI	No	No	0
		7 patient s required ICU assistance			1 case superficial wound infection			

9.	Jauregui JJ et al [18]	No	No	No	No	1 case of osteolysis No revision surgery	1.70%	1.70%
10.	Hernigou P et al [19]	No	No	No	No	No	2 cases of revision surgery	3%
11.	Gonzalez AI et al [20]	No	No	Pain : 2.7^%	15%	11%	34%	2.70%
12.	Hernigou P et al [21]	No	No	No	No	No	No	2.80%
13.	Rowan FE et al [22]	No	No	No	No	1 periprosthetic fracture	2 cases No revision	0
14.	Harwin SF et al [23]	No	Yes	3	1 case	1	1	3.50%
15.	Cypres A et al [24]	No	Yes	1 case of bone atrophy	2 cases (0.8%) superficial infections 2(0.8%) hematomas 1 deep infection (0.4%) 1 (0.4%) femoral fissure 1 (0.4%) case of delirium tremens	1 case of bone atrophy 3(1.2%) cases of osteolysis around the stem	4 fractures Required revision surgery	low
16.	Huten D et al [25]	No	Revision surgeries due to dislocation, septic failure, periprosthetic fracture, and aseptic loosening	No	No	No	No	2.45%
17.	Assi C et al [26]	No	No	No	No	No	No	0
18.	Schmidt A et al [27]	No	Re revision risk 13%	No	No	No	Acetabular bone loss	3.80%

*NM: Not mentioned

RESULTS

Study selection process and demographic characteristics

After watchfully assessing the articles according to the exclusion process as described earlier in this analysis, the studies which were eligible and finally included in the final analysis numbered to be 18. Among these 18 studies, 17 were observed to be observational studies and only 1 study was categorized as RCT.

All the studies were published between year 2011-2021. Among these 9 studies were designed as prospective comparative studies, while 9 studies were retrospective comparative studies [10-27]. Further among all the studies 9 studies focused on outcome and dislocation rates of primary Total hip arthoplasties (THA) using DMC (dual-mobility acetabular cup design) [10,12,14,16,19,21,22,24,25] while rest 9 studies were revision surgeries [11,13,15,17,18,20,23,26,27].

Demographic details

A total of 2859 total THAs (Total hip arthoplasties) with DMC (dual-mobility acetabular cup design) were studied. Sample size from all the studies collectively ranged from 16 to 653 in the DMC treated groups with patients mean age ranging from 48.5 years to 78 years which illustrated that all these studies predominantly included elderly population. Gender distribution revealed that majority of studies (14 studies) were female predominated while only 3 studies showed male predominance [14,23,24], and 1 study [22] showed equal gender distribution. The follow-up period observed from all included studies ranged between a minimum of 12 months to 14 years.

Etiological profile and follow up

Primary etiological cause leading to requirement for primary arthroplasties using DMC as reported by most studies was Osteoarthritis. In revision arthroplasty studies, along with Osteoarthritis, one study mentioned Fracture and Inflammatory arthritis as etiological factor [11]; another study on revision surgery reported,

Congenital Hip dysplasia with Secondary Osteoarthritis, Medial collum fracture and Femoral head necrosis [12]; Similarly, Post-Traumatic arthritis, developmental dysplasia and avascular necrosis were documented etiologies by yet another study [16]; In 2 such other studies Recurrent dislocation, Osteolysis, loose cup, polyethylene wear [23] and trochanteric non-union [25] were again mentioned as important etiological causes leading to revision arthroplasties using DMC.

Posterolateral surgical approach was the predominant surgical approach used in the studies; only one study used a direct lateral approach [17] and only 1 study used both surgical approaches together [11]; whereas two studies [23,25] did not indicate any specific approach used in their studies.

Dislocation rate

The rate of dislocation in DMC treated cohorts varied between 0% and 3.8%. No case of dislocation was observed in 6 included studies [10,12,16,17,22,26]. The dislocation rate risk ratio in primary THA cases, were observed to have significantly low risk of revision. Overall, the difference in dislocation rates in dual-mobility group was quiet low in comparison to the control groups ($p<0.01$). Overall, the dislocation rates in revision surgeries of DMC THA cases were about three times higher ($p<0.001$). We observed a statistically significantly lower dislocation rate in relation to etiological factors like traumatic fractures, degenerative diseases like osteoarthritis or rheumatoid arthritis, and for revision surgery which was not associated with instability causing factors like infection and aseptic loosening.

Complications

Complications were reported under surgical complications and postoperative surgical complications. One or more Post operative complications were reported in all the studies reviewed except one by Assi et al [26]. Common postoperative complications include aseptic loosening, infection, periprosthetic joint infection, Periprosthetic fracture, osteolysis, bone atrophy. Additionally, DVT and Sciatic nerve palsy was also observed in few studies. Heumen et al [13] reported 3 patients which required wound debridement and antibiotic treatment and Sciatic nerve palsy. 2 cases in their study were mentioned to have revision surgery due to postoperative joint infection. In 2 studies by Caton JH et al [14] and Jakobsen T et al [15] patients needed revision surgery for aseptic loosening. Vigdorchik et al [16] accounted 3 revision surgeries; Two due to metal reaction from corrosion at a modular stem-neck junction; and one of the stems for a painful THA. Cypres et al [24] reported 2 cases of postoperative superficial infections; 2 cases with hematomas: 1 case with deep infection; 1 case of femoral fissure and 1 case presenting with delirium tremens. Further they also mentioned 1 case with bone atrophy and 3 cases with osteolysis around the stem and 4 cases of fracture which required revision surgery.

Overall Pooled prevalence of the surgical and preoperative complications along with dislocations, DMC treated hips in comparison to the fixed-bearing hips were observed to have lesser prevalence. The risk of revision was found to be statistically not significantly higher for the control group in comparison to the DMC group.

DISCUSSION

The major insight drawn from the data obtained after analysing the selected studies in our analysis depicted that DMC for THA is more successful in terms of implant survival than standard FB cups and also are successful in avoiding dislocation during study follow-ups. In 1976, Gilles Bousquet pioneered in introducing the concept of the dual mobility. This broadly accepted technology is based on merging the arthroplasty principles explained by Sir John Charnley based on low friction with theory explained by McKee and Farrar, based on the large head concept [5,6,20]. The existence of a larger head diameter, which enabled a broader range of motion within the implant before it completely dislocates. This hereby helped in improving the stability of the implant and thus was thought to be the reason for its widespread success in the following years. This model has gained widespread acceptance as a therapeutic choice for patients who had increased potential for dysfunction following THA surgery, as well as in cases of constant and repeated dislocations.

DMC thus provide a greater range of motion and a broader head-to-neck ratio, which results in lower risk of postoperative dislocation [28]. The biomechanics can be explained as: The larger diameter polyethylene liner encases a smaller diameter femoral head, resulting in the large diameter liner acting as a large femoral head. As opposed to a broad head fixed bearing, the bearing on the inner side follows a motion like the small head, with the potentially reducing the friction and resultant wear off. The inner, smaller head is responsible for most of the significant movement. When the femoral neck collides with the polyethylene bearing on the outer side without being impinged upon, the outer bearing provides greater range of motion inside the articulation [29].

Available literature reports variation in risk of intraprosthetic dislocation rates. Our findings suggested dislocation rates varied between 0% and 3.8% in DMCs treated cohorts in comparison to standard fixed-bearing cup. In 9 primary THA surgeries studied [10,12,14,16,19,21,22,24,25] the utility of dual-mobility system was related to decreased dislocation risk and rates (0%-3%). This dislocation rate risk was observed to have significantly low risk in revision surgeries as well. In rest 9 revision surgeries studied [11,13,15,17,18,20,23,26,27], again a noteworthy low dislocation rate has been documented, ranging from 0 to 3.8 % at medium follow-ups; Cases without any dislocation in DMC group were indicated in all but 6 studies [10,12,16,17,22,26], though statistically significant difference was reported in four articles which included maximum patients. Thus, sample size less than

seems to be one of the determinantal factor affecting the results in the analysis.

Along with these biomechanical benefits and encouraging results, comes the risks and complication issues that are specific to this design. Amongst the complications, Intraprosthetic dislocation (IPD) is known to be the most serious one. Intraprosthetic disassociation, which have also been referred to as "retentive failure," produces distinctive "bubble sign" on simple radiographs, as opposed to the more common extra-articular dislocation. The likelihood of IPD occurrence is one of a serious potential limitation for the usage of DMC implants. This form of design failure has mainly been identified for the first generation of implants.

Donald W Howie et al [30] from their series aimed at discussing the significance of femoral head diameter on articulation mentioned that the presence of dislocation was considerably less for THR cases which had a 36-mm femoral head in comparison to a an articulation of 28-mm (0.8% Vs 4.4%); they reported that after revision hip surgeries dislocation rate for 36-mm femoral head was 4.9% while it was 12.2% with 28-mm head; but this difference was not statistically significant.($p = 0.273$).

In our present research analysis, 4 authors reported occurrence if IPD complications in their studies. Vigdorchik et al [16] reported one case of periprosthetic fracture of femur bone, while Cypres et al [24] reported 4 cases of fracture which required revision surgeries, along with 1 case of bone atrophy and 3 cases of osteolysis around the stem. Huten et al [25] reported revision surgeries due to dislocation and periprosthetic fracture. Gonzalez et al [20] reported an increased rate of fractures closing to about 11% in their cases studies. Recently, Romagnoli et al [31] in their research review on newer generation DMC implants also reported early cases of IPD. Hence, to explain this crucial aspect, further research with a longer duration of surveillance is needed. Additionally, Other important factors like Patients' age, obesity, comorbidities, history of revision surgery, repeated dislocation, and some factors associated with the surgical approach have all been associated with enhanced dislocations previously in literature reviews.

Bouchet et al [10] believed that usage of DMCs in ‘‘young" patients should be restricted due to the polyethylene liner, which is inevitable in this form of component. They suggested it should be rather restricted to relatively elderly patients rather than a first line treatment option in young patients. Wearing away of the rim/liner within the device results in intra-prosthetic dislocations, which appears to occur in relatively young patients over time, but it appears to be uncommon after the age of 70. While on contrary, Rowan FE et al [22] reported no dislocations of DMC component, in their younger population with no prospective failures of the acetabular components.

Another potential complication observed specific to this design is increased infection rates, aseptic loosening, and the likelihood of speedy wear. Boyer B et al [32] mentioned that the use of DMC components may cause a subsequent growth leading to aseptic loosening. Previous literature reviews documented prevalence of aseptic loosening using DMC system in the range of 0% to 8.3%. In our present research analysis, we observed absence of aseptic loosening in 7 of reviewed studies [10,12,16,17,21,25,26]; On contrary, rest 11 reviewed studies reported prevalence of aseptic loosening ranging from 0.02% to maximum of 34%. Aseptic loosening possibly be related to particulate debris caused by bearing surface degradation, but there is no evidence of a connection between aseptic loosening and DM components associated with polyethylene liner. THA's dual mobility nature permits a double-sided wear, making it the only one in which two surfaces (both inner and outer side) of polyethylene (PE) can be worn.

Due to a lack of comparable evidence, the impact of dual-mobility implants on revision for aseptic loosening in primary THAs is unknown. Gonzalez et al [20] reported the utility of dual-mobility implants in cases where instability and dislocation were observed, while the traditional constructs were primarily used for aseptic loosening. They were of an opinion that to better understand the risks and benefits of the dual-mobility system relative to the older and traditional ones, larger studies with increased sample size and long term follow ups are required.

Overall, from all the reviewed studies we observed that, patient’s condition showed progressed from “poor” health to “good” health during follow-ups. Likewise, in a study by Harwin et al [23] statistically significant and better HSS scores were observed for DM cohort in comparison to fixed-bearing implants. The mHHS tool does not provide a physician's evaluation of the patient, and there is no clinically significant distinction between mHHS and HHS. Two recently established score namely UCLA and WOMAC scores, have also been used in studies as outcome measures.

Julio J Jauregui et al [18] believed there were no major variations in functional outcomes, activity level, or overall physical and mental health status between the two studied cohorts. Dual mobility cups had less dislocation when used in the revision surgeries. They further mentioned that implant design, could decrease complications while simultaneously improve functional outcomes in the patients. But still requirement of larger cohort studies prevails to substantiate this. Sarunas Tarasevicius et al [12] found that at around 1 year follow up after surgery, the functional results favoured DAC implants as they presented with decreased incidence of dislocations.

Even though we provide a valuable regarding the dislocation rates and outcomes from the literature on DM cups usage and technology in total hip replacements, our study has many limitations. Our study data comprised of comparatively small number of studies with moderately less patient population. Secondly, the designs and biomechanics of the market constructs may vary, and the polyethylene types and range of designs were not studied, which could influence long-term outcomes.

Additionally, there is still need for larger prospective studies to validate and compare outcomes of dual mobility implant THA, particularly in populations with high risk of dislocations.

CONCLUSION

Hence in conclusion, within the limitations of our study and from the existing data, this systematic analysis supports the usefulness of dual-mobility cup implants in minimizing postoperative dislocations and instability in patients undergoing total hip arthroplasties. Nevertheless, more research is required to compare the risks and benefits of dual-mobility constructs in the long run settings, with contemporary traditional implants in THA surgeries. Hence, it becomes advisable that before advocating the use DMC implants for regular primary complete hip arthroplasty, further research and longer-term follow-ups are needed.

PATENTS

Not applicable.

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SUPPLEMENTARY TABLES

Table S1, Table S2, Table S3.

CONFLICTS OF INTEREST

No conflict of interest.

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