



Total hip arthroplasty and sexual activity: a systematic review

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Abstract

Hip discomfort due to degenerative pathologies causes limitations in the everyday activities of patients, including sexual activity. To address such limitations, patients are usually treated with total hip arthroplasty (THA). The aim of this systematic review was to investigate the success of this surgical procedure to ameliorate sexual activity of patients. We performed a comprehensive research of four electronic databases for articles pertaining to the benefits of THA on sexual activity. Exclusion criteria included articles not in English. The search initially yielded 34 articles. Two authors subsequently read all abstracts and excluded all studies unrelated to the topic, leaving 16 articles for further evaluation. Sixteen articles filtered by orthopaedic departments were included in this review. A total of 2391 patients were considered. Pre- and postoperative reports on sexual concerns have been evaluated and compared. The current literature suggests that sexual life is improved after THA. Patient education regarding postoperative expectations and resumption of sexual activity is severely lacking and the majority of surgeons offer little or no information on the subject. Specifically designed studies on the subject are required to evaluate the effects of surgery and approaches on postoperative restrictions.

Keywords Total hip arthroplasty · Sexual activity · Quality of life

Introduction

Chronic hip pain has a significantly negative impact in many life aspects including sexual activity [1]. Indeed, lower levels of sexual satisfaction has been shown in patients with hip arthritis [1–3].

Usually, chronic hip pain and joint stiffness due to hip arthritis are treated with total hip arthroplasty (THA) with a high rate of success. Indications for THA are increasing, especially in young patients who have high functional expectations and are sexually active [4]. An active sexual life is critical for quality of life (QoL) and has been linked to a better overall health [5]. The World Health Organization (WHO) defines sexual health as “*a state of physical, emotional, mental and social well-being in relation to sexuality*” [6], thus linking the overall quality of sex life to the general well-being. Hence, improved sexual function must be of crucial importance after THA, and it can be linked to the overall postoperative patient satisfaction [2, 7].

Under this perspective, it is obvious that sexual counseling before and after THA is essential, while preparing a balanced resumption of sexual activity. However, patients seldom discuss their sexual concerns, and surgeons do not always engage patients and their partners in a conversation regarding safely resuming sexual activity, even though this should be a key step for comprehensive patient care.

The aim of this systematic review is to scrutinize the available literature on the effects of THA on sexual activity before and after the surgical procedure.

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Materials and methods

We performed a comprehensive search of four electronic databases (PubMed, Google Scholar, Cochrane Reviews, and Ovid) for articles pertaining to THA and sexual activity. The research conducted was unrestricted. The used search thread included the keywords sex* [title] AND total* [title] AND hip* [title] AND arthroplasty* [title] OR replacement* [title]; the search string sex* [title] AND education* [title] AND arthroplasty* [title] OR replacement* [title] was also employed. Additional searches were conducted using the keywords sex, sexual, life, hip arthritis, and hip arthroplasty in both title and abstract. All resulting journals were considered. All article types were taken into consideration including case reports, letters, communications, and prospective and retrospective studies. The individual references of the selected articles were also scrutinized in an attempt to find more sources. Exclusion criteria consisted: articles not in English; studies related to sexual performance after other major orthopaedic procedures, such as total knee arthroplasty; articles where data for THA alone could not be extracted; the presence of other major joint involvement and hip revision surgery. After title, abstract screening and duplicate removal 34 papers were identified for full text retrieval and review (Fig. 1). Two authors subsequently read all abstracts and excluded all studies deemed to be unrelated to the current study. In case of doubt regarding inclusion or not of a given article, the senior author made the final decision. Based on study design, inclusion, and exclusion

criteria, 18 articles were excluded. The cumulative raw data from all articles were analyzed using a computer-based statistical software (GraphPad Prism, GraphPad Software Inc, La Jolla, CA). A *p* value of less than 0.05 was considered to be statistically significant. However, large discrepancies in the reported data and timeframes did not permit analysis of adequate power for this study to be a meta-analysis.

Results

Through the reported research strategy, we found 16 eligible studies dealing with the effects of THA on sexual quality of life (SQoL). Of these 16 studies, 10 were retrospective cohort studies, 4 were prospective cohort studies, 1 was translation and validation of a questionnaire into Dutch, and 1 was a case-control study (Table 1).

The first studies were conducted in the UK in 1970 and 1972 by Currey and Todd, respectively. The geographic distribution shown that four studies conducted by departments in the USA, three in the UK, three studies were conducted in Sweden, two in France, one in the Netherlands, one in Korea, one in Japan and the most recent one in Morocco. The time distribution of these studies demonstrated an increasing interest on the subject which is reaching a pick on the year of 2014. A significant drop on the following years is additionally noted (Fig. 2).

The majority of these studies were based in Hospital Orthopaedic Departments with the exception of Yoon et al. in Korea for which face-to-face interviews took place in an outpatient setting. Personal interviews took place in two more studies while the rest of the departments 13/16 used written questionnaires (81.25%). The first questionnaire on the correlation between SQoL and THA was suggested by Currey in 1970. Several questionnaires were made after the initial one either affected by Currey or other studies, but most of the departments preferred to add questions on sexual function to the patients' initial interviews. Only four studies sent their questionnaires by post ($n = 25\%$), and telephone interviews were conducted in two ($n = 12.5\%$).

Patients' characteristics

The total number of patients included in the reported studies was 2391 (646 female, 902 male, and 843 gender not clearly stated) ranging from 18 to 694 patients. Changes in sexual activities after THA were generally studied in both sex. Fourteen authors investigated the effects of THA on SQoL both in men and women (87.5%) with the exception of the studies conducted by Meyer et al. with 60 women and Wang et al. investigating 247 men. All articles underlined the specific main complains of their patients preoperatively except for three. The majority of authors reported pain as the

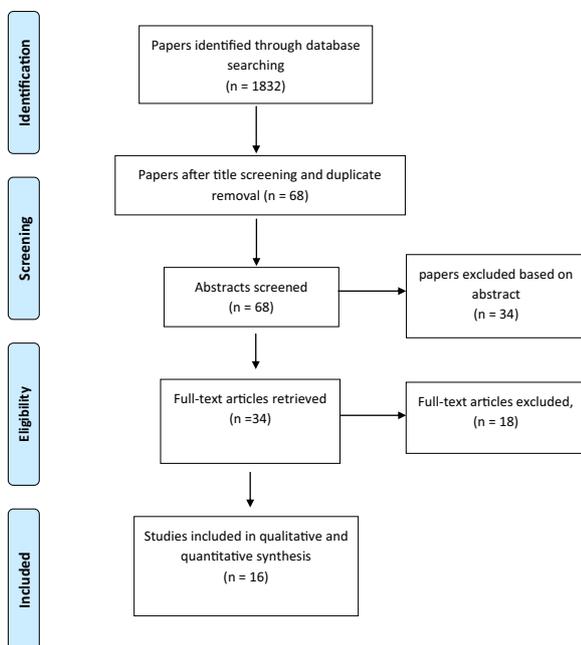


Fig. 1 Prisma workflow

Table 1 Studies included in the current systematic review

Author country	Study design	No. of patients	Main complains		Outcome post-op	Study quality/limitations
			Male	Female		
Currey, UK 1970	Retrospective cohort, questionnaire	121	Stiffness	Sexual difficulty	Pain relief and relief of sexual problems	Single postoperative questionnaire
Todd, UK 1972	Retrospective cohort, interview and survey	79	Pain, stiffness	Stiffness	90% pain relief	Single postoperative questionnaire
Baldursson, Sweden 1979	Retrospective cohort, questionnaire	44	Pain, stiffness		48% M/43% F relief of sexual problems	RA patients, less predictable outcomes
Wiklund, Sweden 1991	Case-control study, questionnaire	56	Pain, energy, sleep		Improvement after THA	
Stern, USA 1991	Retrospective cohort, questionnaire	86	73% sexual difficulty 68% stiffness 31% arousal difficulty		10 Patients sexual difficulty due to other reasons	
Meyer, Switzerland 2002	Retrospective cohort, questionnaire	60	20% decreased sexual desire NA	NR	Significant improvement in sexual function ($p = 0.001$)	Single postoperative questionnaire
Gosens, Netherlands 2005	Translation and validation of questionnaire into Dutch	18	57% sexual difficulty		75% pain relief	Only patients with favorable outcomes eligible
Laffosse, France 2007	Retrospective cohort, questionnaire	135	Pain and stiffness		55% resumed intercourse 2 months post-operation	
Wall, UK 2011	Prospective cohort, survey on surgeons	86	19% severe to extreme sexual difficulties 77% limited sexual activity due to hip pathology especially in women		35% relief of sexual problems	
Yoon, Korea 2013	Retrospective cohort, face-to-face interview	64	61.8% hip motion limitation 17, 6% hip/back pain		33% increase in quality of sexual relations 30% unchanged sexual function 25% increase in sexual encounters	Only women included, various hip pathology included
Nunley, USA 2014	Prospective multicentre cohort, phone interview	694	NR	NR	18% sexual difficulty postoperatively at 1-year follow up and 24% at 2-year follow up	

Table 1 (continued)

Author country	Study design	No. of patients	Main complains		Outcome post-op	Study quality/limitations
			Male	Female		
Wang, Japan 2014	Prospective multicenter cohort, questionnaire	247	Impaired sexual function and partner relationship	NA	Increase in satisfaction due to less pain and greater mobility	Only male patients, mostly THA for AVN
Palazzo, France 2014	Prospective multicenter cohort, phone interview	123			50% improvement in sexual activity	
Laverma, USA 2015	Retrospective cohort, questionnaire	159	72% sexual limitation mostly due to pain	96% sexual limitation mostly due to pain	Pain relief and improvement in motion	Both pre and postoperative questionnaires
Pritchett, USA 2017	Retrospective cohort, questionnaire	149	54% sexual limitation due to pain and motion limitation	86% sexual limitation due to pain and motion limitation	99% no hip related limitations in sexual function 19% increase in sexual frequency	Both pre- and postoperative questionnaires, unique implant, young patients
Zahi, Marocco 2017	Retrospective cohort, questionnaire	270	37.4% Hip and back pain 36.3% limited hip motion Mostly affecting women		Female resumed to sexual activity significantly later than men 70% unchanged frequency of sexual function (18.5% increase, 11.5% decrease)	Single questionnaire, multiple diagnoses for THA

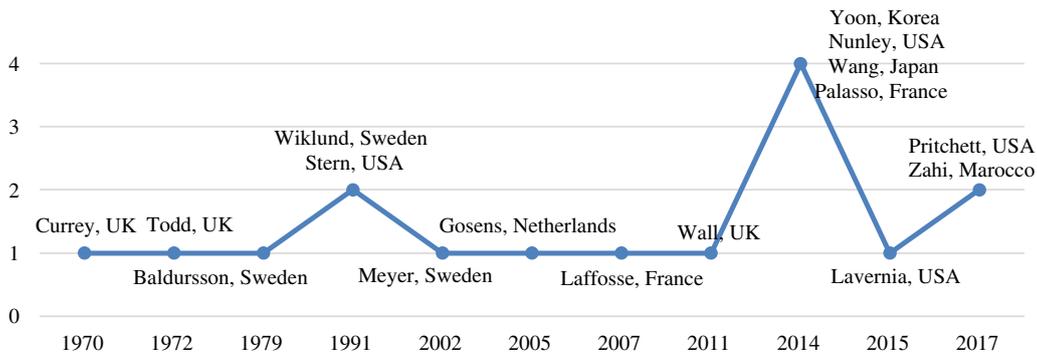


Fig. 2 Time distribution of studies on the effects of THA on SQoL

most prominent complain (8 papers), followed by stiffness (5 papers), and limited hip motion in (3 papers).

The mostly bothersome reported complain was pain in 99 males and in 150 female patients, followed by hip stiffness in 36 males and 124 females and limited joint motion in 44 males and 75 females. It is important to note though, that for the majority of these studies, questioners were used to evaluate preoperative symptoms affecting SQoL and thus total scores are provided, not precise numbers.

Women's sexual function seems to be more affected from hip arthritis than men's. Five of the studies underline that womens' sexual function was more affected preoperatively than mens', while Wang et al. noted the impaired partner relationships due to hip pathology.

Three of the articles investigated only married individuals or patients with a stable partner, whereas Lavernia et al. preferred to investigate sexually active patients without referring to their sentimental situations.

Effects of THA on SQoL

All the studies report benefits in SQoL postoperatively. Six studies specifically measured the percentage of patients with improved SQoL after THA. Seven underline the importance of pain relief postoperatively in the improvement of SQoL which is reaching high percentages of 98% of the patients in recent studies by Nunley et al. Increase in sexual activity is only measured in five, while two studies underline the change in preferred coital position postoperatively.

Sex differences

Ten studies involving 1943 patients reported the differences between male and female patients. Women seems to be significantly more sexually disabled by hip arthritis compared to men, despite that post-THA, overall sexual improvement is achieved significantly later than men. Moreover, differences were also found in the site of mechanical impingement

between femur and acetabulum. In women, impingement mostly occurred in the anterior–superior area of the acetabulum, whereas in men, it most commonly occurs in the posterior–inferior area of the acetabulum.

Sexual position

Sexual allowed position differs between sex, approach used, and time since surgery. Between the first and second month after surgery, sexual activity may resume in the supine position. Lateral decubitus during sex is not advised in the immediate postoperative period, since it can lead to adduction and internal rotation. After the third month, there should be no limitations [3]. Supine (missionary) position is generally the most recommended position for preventing hip dislocation [2]. Supine position at maximum abduction is considered to be the safest position for both genders. The only position for both genders considered by 90% of the surgeons to be the safest was that both partners standing with woman slightly bend and male approaching from behind [8]. Four sexual positions for women and one sexual position for men should be avoided after THA, based on the results of an in vivo study which determined joint kinematics with the use of MRI [9]. The positions that should be avoided for women included (1) rear penetration, (2) woman on top and leaning forward, (3) face-to-face side lying, and (4) woman supine with knees flexed and legs apart, with the man lying on a side perpendicular to the woman, with the man's hips under the arch formed by woman's legs. The only position for men that should avoid after THA was face-to-face side lying.

Discussion

The aim of this paper was to review the current available literature in order to evaluate the effects of THA on sexual activity. We found 16 eligible papers including a total of 2391 patients. The main results obtained by this review is

the global improvement in the sexual activities and SQoL in both sexes after THA.

Currey, in a retrospective study of 121 relatively young patients (less than 60 years old), was the first to study sexual dysfunction related to hip arthritis [1]. Of the patients included, 81 (67%) reported some degree of sexual difficulty related to their baseline hip arthritis. 25% of the patients involved reported unhappiness or tension in their marriage, as a direct result of the underlying medical condition. The author concluded that THA shown to be effective in alleviating sexual issues postoperatively. In a similar study by Todd et al. involving 79 patients with hip arthritis, 11 men (22%) and 39 women (49%) stated that their sexual problems were present due to arthritic hip, while for the rest, other sever problems coexisted [10]. Postoperatively, 60% of these patients reported significant relief. Laffosse et al. performed a similar study on 135 patients (age range 22–65 years) who underwent THA for hip arthritis [2]. In this cohort, sexual problems commenced at a mean age of 45 years (range 21–63 years), or on average 2.5 years after the onset of hip pain. Twenty-six out of 135 patients (19%) considered hip pain to have a negative impact in their sex life, with a 7% reporting having unwanted tension or unhappiness in their relationships. The source of sexual difficulty was attributed primarily to pain, followed closely by hip joint stiffness. The authors found that THA was related to a significant increase in the frequency of sexual contact postoperatively, with 70% of patients becoming again sexually active postoperatively. The beneficial effects of surgery were not manifested until 3 months postoperatively, with men being quicker to resume sexual contact, as compared to women. Authors hypothesized that this was related to the fact that men tend to apply less force to the range of motion of joints during sexual intercourse. Wiklund et al. performed a prospective study in order to evaluate function on 56 patients with hip osteoarthritis (mean age 60 years; range 20–79 years) and found that after THA, patients improved in all domains, including housework, holidays, hobbies, social life, family life, and sexual function [11]. Nunley et al. evaluated 806 patients younger than 60 years of age, who underwent THA. They found that 89.5% of the patients included to be sexually active postoperatively, while preoperatively only 81.5%. Baldrsson and Braattstrom using a questionnaire evaluated the effects of THA in 44 patients with rheumatoid arthritis. Preoperatively, 28 patients reported sexual difficulty due to hip pain, while postoperatively, 27 patients reported that they no longer experienced sexual problems, or if so, these were not related to their hip condition.

A prospective study on 99 male patients, performed by Nordentoft et al., was the only study to claim a significant worsening in sexual activity and erectile function after either

THA or TKA, even though this is probably explained by the significantly older mean age of 70.6 years compared to the rest of the studies [12].

The reasons for preoperative sexual difficulty vary in the literature. Among those included, hip pain, back pain, deformity, stiffness, fatigue, negative body image, and foremost range of motion limitation are the most commonly cited [1, 8, 10, 13, 14]. Other factors have also been implicated, even though less frequently. Sexual desire may be affected as a side effect of the medication used for chronic pain. Painkillers, muscle relaxants, and antidepressants affect desire and arousal in men. Antalgic posture during sex and an attempt to modify positions may have a severe effect in the spinal column causing fatigue and often a decrease in sexual desire [2].

Notable differences have been reported between sexes. Currey et al. [2] found that women would tend to resume sexual activity significantly later than men. Authors attributed this to the fact that women have to use more abduction and external rotation, as well as a greater force applied to the hip during sexual intercourse, as compared to men. A study by Nunley et al. [15] including 270 patients (116 women, 154 men; age range 21–63 years) found women to be significantly more sexually disabled as compared to men. Authors attributed this to the fact that women were more likely to have hip dysplasia, which would lead to sexual dysfunction much sooner than primary hip osteoarthritis. Conversely, Nunley et al. found that male patients were four times more likely to report being sexually active after the operation, but 60% less likely than female patients to have improvement in SQoL. Males, in this particular study, were also 45% less likely than females to report an increased sexual frequency postoperatively [16].

THA dislocation due to impingement also differs between men and women. A biomechanical study of multiple sex positions was performed by Stern et al. [9]. In this study, two healthy volunteers have been used to assess the risk of bony impingement or instability. In women, impingement occurred in the anterior–superior area of the acetabulum. Conversely, in men, impingement was found to occur in the posterior–inferior area of the acetabulum. Consequently, males tend to sublunate anteriorly and women posteriorly during the various sexual positions. This finding should be considered while settle the surgical approach. Hence, it can be inferred that posterior approaches should be preferred in male patients and anterior approaches in female in order to reduce the risk of impingement and subsequent subluxation.

Gender differences in coping with musculoskeletal pain are already been evaluated by the current literature. Grossi et al. [17] found a poorer adjustment to pain in women than in men suffering from musculoskeletal pain. Compared to male patients, women reported more disability, larger analgesics consumption, more work strain, higher levels

of post-traumatic stress reactions, and a lower self-esteem. All these factors directly affect sexual response in women. Moreover, the initiation of sexual activity is a complex emotional and physical procedure that can be influenced by a series of factors, all of whom cannot be quantified. Meyer et al. [18] demonstrated the effect of social factors in the re-initiation of activities of daily living in THA patients, demonstrating the negative effect of perceived negative life events. Although sexual life was not specifically studied, it seems that if mundane activities can be negatively influenced, complex activities requiring human interaction are bound to be equally, if not more severely affected.

Another important issue in the relation of THA and sex is the availability of pertinent information to patients, both prior and after the surgical procedure. Kurtz [1] found that 48% of the patients preferred written instructions, presented in a booklet format. Other authors noted that 65% of patients undergoing THA reported that they would have found a relevant discussion with their surgeons beneficial [10, 13]. Dahm et al. found that specific information was only available upon patient's request and that the general recommendation was to resume sexual activity 1–3 months after surgery [8]. Laffosse et al. found that patients generally considered their surgeon and secondarily their physiotherapist to be the most appropriate person to deliver information verbally on sexual function after THA and prefer their partner to be present during the conversation. As for the information provided, only 21% of this population was warned about risky sexual positions.

Sexual concerns, however, are seldom adequately discussed between patients and surgeons [13]. Dahm et al. reported that although 89% of patients present the desire of more detailed and specific information on the issue, rarely their surgeons would meet their expectations. Moreover, those few surgeons who actually discussed the matter, spent on average less than 5 min [8]. Yoon et al. found that the risk of postoperative dislocation was the patient's foremost concern when contemplating resuming sexual activity [14]. 80% of surveyed patients could not obtain information on this issue, whereas 39% had experienced leg positioning problems during sexual activity. Furthermore, most of the patients preferred to not discuss their sexual issue with the surgeon, as they considered it to be too personal. Instead, they tried to find additional relevant information in other more impersonal ways. Meyer et al. performed a retrospective review on 224 female patients who underwent THA (mean age 44.5 years). They found that most of them preferred to receive postoperative information regarding sexual activity on the internet or via brochures. This was likely to their reluctance to speak to their surgeon due to the sensitive nature of the matter. They also noted that female patients did want information on safe sexual positions after surgery. Moreover, 57% of the

included women waited more than 4 months before resuming sexual activity, likely as a result of receiving poor or no information on the issue [19].

Prudence with regard to resumption of sexual activity after THA is well supported in the literature and should generally be advised for 1–3 months postoperatively, as 75% of dislocations occurs in this period. One month is the minimum time required for the periarticular tissue (in case of employment of a posterior approach) to heal properly [20, 21]. Anterolateral and anterior approaches are thought to have less risk on early postoperative dislocation; thus, it is supported by some authors than an earlier resumption of sexual activity may be reasonable [2].

In conclusion, despite the common ground that hip pain and stiffness caused by hip pathology are the main causes of impaired sexual function, and the alleviation these complaints by THA, the effect of the latter on postoperative sexual function is understudied. The current literature suggests that sexual life is improved post-THA, but to a varied extent, influenced by a countless of factors both physical and mental. Patient education regarding postoperative expectations and resumption of sexual activity is severely lacking and the majority of surgeons offer little or no information on the subject. As the number of patients with a THA is expected to increase over the next years, well-designed studies on the subject are required to evaluate the effect of surgery and approach on the postoperative restrictions and form the base for standardized patient education and instructions regarding expectations and safe resumption of sexual activity.

Compliance with ethical standards

Conflict of interest The authors of this study declare no conflicts of interest.

Ethical approval This article does not contain any studies with human participants performed by any of the authors.

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