

# An analysis of online searches of femoroacetabular impingement patients

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## ABSTRACT

**Aims:** This study compiles frequently asked questions on Google about femoroacetabular impingement (FAI) surgery. The purpose of the study was to evaluate the questions asked to google about FAI and to inform orthopaedic surgeons by drawing attention to the questions that patients are curious about this subject.

**Methods:** A set of search terms was entered into Google Web Search using a cleanly installed Google Chrome browser. Frequently asked questions and web pages were extracted into a database through a data mining extension. Questions were categorized according to topics related to hip impingement repair. Websites were scored for quality using the JAMA Benchmark Criteria.

**Results:** A total of 540 questions were generated from the initial search. After duplicates were removed 364 original questions were extracted and each question was categorized. The most popular question topics were activities/restrictions (17.5%), pain (16.7%), and indications/management (14.5%). The 2 most common websites searched were academic (34%) and medical practice (29.4%). Government websites were more likely to be associated with Recovery time (24% of all Government websites). The average JAMA score of websites was 2.51. Commercial and Academic websites had the highest JAMA scores (2.9 and 2.7 respectively).

**Conclusion:** This study the most frequently asked questions by patients regarding FAI surgery. The topics that patients were most curious about were postoperative activities, pain management, and surgical indications. The most frequently visited sites were academic and medical practice content, with JAMA scores of moderate qualities. These results suggest that more emphasis should be placed on patient education to meet patients' information needs. A guide called frequently asked questions can be created for orthopedic surgeons to advise patients. Patients can easily access the answers to these questions on the website.

**Keywords:** Arthroscopy, femoroacetabular impingement, FAI, Google, JAMA score, online search

## INTRODUCTION

Hip pain is a prevalent cause of disability, resulting in chronic hip pain affecting 30 to 40 percent of adult athletes and leading to a reduced quality of life.<sup>1,2</sup> Among the broad range of possible causes, one rapidly evolving etiology of hip pain is femoroacetabular impingement (FAI) syndrome. The first mention of hip impingement in the literature dates to 1936.<sup>3</sup> Ganz et al.<sup>4</sup> identified what is now known as FAI syndrome as irregularities in femoral and acetabular anatomy, resulting in abnormal contact and mechanical forces across the joint. Five essential elements for diagnosing FAI were defined: abnormal morphology of the femur and acetabulum, abnormal contact between these structures, forceful movements causing

abnormal contact and collision, repetitive motion leading to sustained damage, and subsequent soft tissue damage presence.<sup>5</sup>

Patients who have received information about FAI surgery from an orthopaedic surgeon are seeking further details about the procedure. Given that more than two-thirds of adults admit to using the internet for medical queries, online health information has an infinite potential to provide valuable education when sources are evidence-based and easily readable.<sup>6</sup> Google is the most used search engine in the United States (86%) for patients using the Internet for their current orthopedic complaints.<sup>7,8</sup> Google's machine

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learning algorithm analyzes thousands of individual searches to provide suggested searches when a query is entered. This advanced search algorithm also allows users to view frequently asked questions related to the initial search query, enabling individuals to see the most asked questions on specific topics on the internet.<sup>9,10</sup>

Patients are eager for information, particularly since FAI is a newly recognized term, prevalent among athletes, and affects individuals at a younger age. While some turn to books for answers, the majority rely on search engines. Over time, these queries have formed common questions and search patterns. Identifying the most frequent inquiries and providing thorough responses prior to surgery can greatly benefit patients. The purpose of this study was guiding orthopaedic surgeons toward these questions and offer patients clear and illuminating answers to preoperative and postoperative concerns. The hypothesis was that FAI surgery can offer valuable insights into patients' worries regarding physical activity, surgical methods, recovery, and potential complications.

### METHODS

The study was conducted in accordance with the principles of the Declaration of Helsinki. Institutional ethics committee approval was not required for this review article.

The algorithm of frequently asked questions on the Google search engine was the denominator of the study. Questions regarding femoral acetabular impingement and websites containing answers to these questions were carefully analyzed. A Google search engine (www.google.com) on a clean-install Google Chrome browser was used to prevent any effect of previous personal search history. The search engine (www.google.com) was used in a cleanly installed Google Chrome browser (version 127.0.6533.26, Menlo Park, CA) on June 15-20, 2024 to minimize the effects of personalized search algorithms. "Femoroacetabular impingement", "hip arthroscopy", and "hip impingement" terms were searched on Google web search. For each search term, frequently asked questions were refreshed until a total of 84 questions and sources of answers were collected. With the observational study, the questions were separated by Rothwell's Classification System. Data mining extension (Scraper, version 1.7) was used to extract each question and its associated webpage to a database. 2 reviewers classified questions according to Rothwell's classification system (MA, SS). This classification allows the questions to be categorized and divided into headings. Questions were categorized into three groups (fact, policy, value) based on Rothwell's classification system.<sup>10</sup> Each group was further detailed into specific subtitles; activities, restrictions, timeline of recovery, technical details, cost, anatomy/ function, diagnosis, indications/management, risk/complications, pain, longevity, evaluation of surgery, injury comparison, and others. Websites were classified as commercial, academic, medical practice, single surgeon, personal, government, social media, and others depending on the source. JAMA benchmark criteria were used to assess the quality of websites depending on authorship, attribution, currency, and disclosure, with a score out of 4 points.<sup>11,12</sup> After

the initial classification, discrepancies between the 2 reviewers were resolved by a third party (MA).

### Statistical Analysis

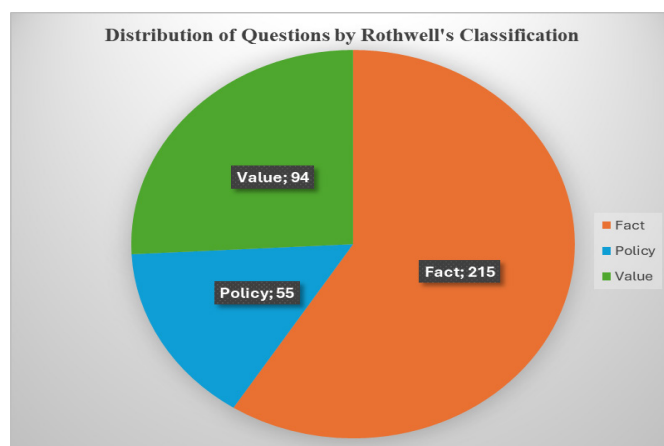
All statistical analyses were performed using Microsoft Excel (Microsoft, Redmond, USA). Cohen's kappa coefficients were calculated for interobserver reliability. The K value indicates agreement among observers. Landis and Koch previously categorized K values of 0.00 to 0.20 as slight agreement; 0.21 to 0.40, fair agreement; 0.41 to 0.60, moderate agreement; 0.61 to 0.80, substantial agreement; and 0.81 or greater, almost perfect agreement. The kappa value for the interobserver reliability was=0.90 (excellent agreement) for website classification. For question analysis, a Fischer exact test for proportions was performed to compare question categories and website classifications. Statistical significance was defined as a p-value less than 0.05.

### RESULTS

A total of 540 questions were generated from the initial search. After duplicate questions were removed 364 original questions were extracted and each question was categorized. The top 10 most frequently asked questions for hip arthroscopy are presented in **Table 1**.

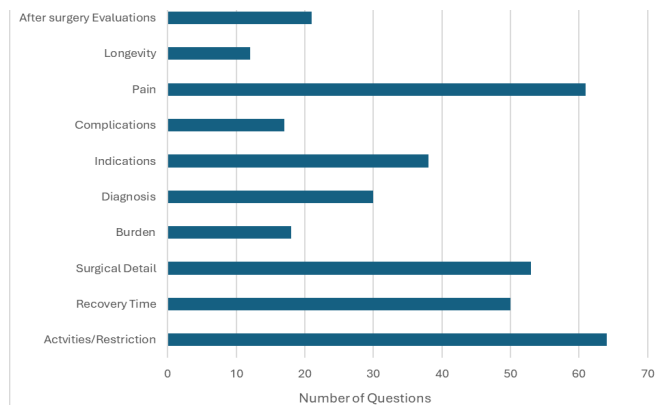
What is hip arthroscopy?
What sort of conditions can be treated?
What causes these conditions?
What does 'hip arthroscopy' entail?
What is the expected recovery?
What are the success rates of surgery?
I think I have a hip problem; how should I go about getting in contact with a qualified hip surgeon?
How long does recovering from hip impingement surgery take?
What does hip impingement feel like?
What are the types of hip impingement?

Most questions were in the Fact category according to Rothwell's classification (**Figure 1**). The most popular question topics were activities/restrictions (17.5%), pain (16.7%), and surgical detail (14.5%).



**Figure 1.** Percentage of questions according to the Rothwell classification under the fact, policy or value question headings in the diagram

Upon analysis of the searches, there was a notable curiosity regarding activity, pain, and surgical methods. The questions posed on various websites were classified using the Rothwell methods. **Figure 2** categorizes these questions based on their content.

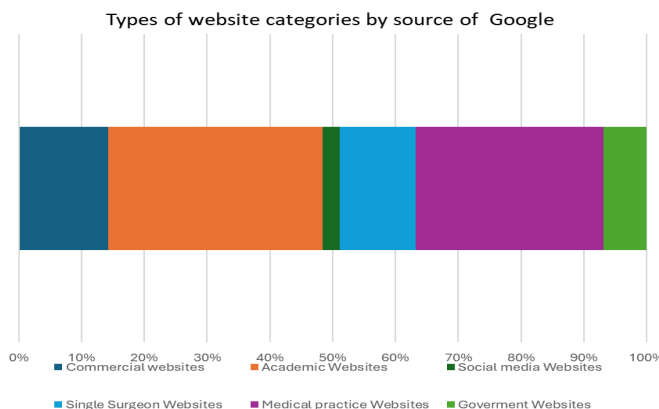


**Figure 2.** Relative distribution of questions by Rothwell's classification and by topic. The number of questions in each topic category

The questions are mostly in the fields of academics and medical practice. The questions were focussed primarily on academic and medical practices. Questions about physical activity, pain management, and surgical procedures were important components of the inquiries. The websites and question types were grouped in detail (**Table 2**).

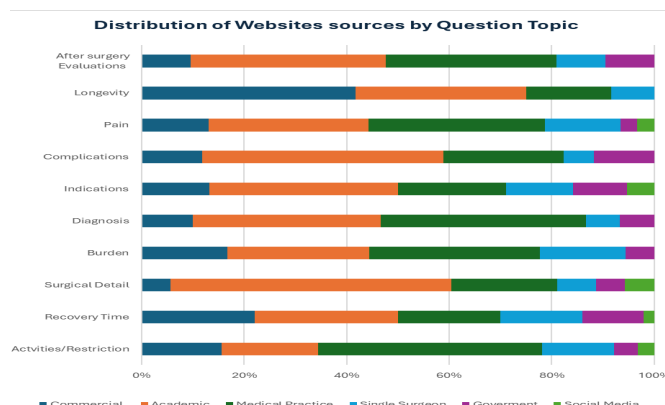
The distribution by website source and topic showed that the two most frequently searched websites were academic (34%) and medical practice (29.4%). The distribution of website sources is summarized in **Figure 3**.

In the question topics of the website resources, the most searched topics were pain, activity, and surgical technique. These questions are detailed in **Figure 4**. Commercial websites were significantly more likely to be associated with questions about recovery time (21.1% of all commercial websites) and



**Figure 3.** Types and percentages of website categories according to Google source

activities/restrictions (19.2% of all Commercial websites). Complications questions are more likely to be associated with Academic websites (47% of all questions). Academic websites are significantly more likely to be associated with surgical details of surgery (23.3%). Academic websites are more likely to be associated with surgical details of surgery detailed results are shown in **Figure 4**.



**Figure 4.** The percentage of questions in each website category-separation of questions asked into answered websites and types of questions

	Commercial	Academic	Medical practice	Single surgeon	Government	Social media	Total	p-value
Fact	30	71	67	26	15	6	215	0.0214
Policy	7	22	12	6	6	2	55	0.6789
Value	15	31	30	12	4	2	94	0.1147
Total	52	124	109	44	25	10	364	-
p-value	0.3026	0.1061	0.0506	0.8755	0.8712	0.9458	-	-
Activities/restriction	10	12	28	9	3	2	64	0.0412
Recovery time	11	14	10	8	6	1	50	0.0023
Surgical detail	3	29	11	4	3	3	53	0.3287
Burden	3	5	6	3	1	0	18	0.8912
Diagnosis	3	11	12	2	2	0	30	0.1576
Indications	5	14	8	5	4	2	38	0.7801
Complications	2	8	4	1	2	0	17	0.4456
Pain	8	19	21	9	2	2	61	0.0098
Longevity	5	4	2	1	0	0	12	0.6214
After surgery evaluations	2	8	7	2	2	0	21	0.0034
Total	52	124	109	44	25	10	64	-
p-value	0.0239	<.001	<.001	0.0127	N/A	N/A	-	-

The average JAMA score for the different website categories was 2.516 (Table 3). Commercial and Academic websites had the highest JAMA scores (2.9 and 2.7 respectively). Websites were scored according to JAMA criteria. The commercial website received the highest score (2.9). Even though we think that it is the patient who asks the questions, some of these questions may have been asked by the assistant or specialist doctors to get quick information. However, websites associated with medical practice and single surgeons had the lowest JAMA scores (2.16 and 2.22 respectively).

Website classification distributions	JAMA Score	n (%)
Academic websites	2.7	124 (34.06)
Medical practice websites	2.16	109 (29.94)
Commercial websites	2.9	52 (14.28)
Single surgeon websites	2.22	44 (12.08)
Government websites	2.42	25 (6.86)
Social media websites	2.68	10 (2.74)
Total websites	2.516	364 (100)

## DISCUSSION

The important finding of this study is that hip impingement patients obtain information about their disease by asking questions such as activity and limitations, pain, surgical techniques, cost, and return to work on the search engine. Here, the surgeon informing the patient by considering these questions and providing postoperative education will ensure that the patient is safe. It was discovered to include going to the toilet, playing sports, driving, and starting to walk after undergoing hip impingement repair. Interestingly, the most frequently used sources for this information were medical practice websites and social media.

It is important in the treatment of hip impingement repair to know what questions patients ask. This knowledge enables doctors to have an idea of patients' concerns, allowing them to discuss the treatment stages and possible complications in detail. This approach facilitates patient-centered care, leading to better outcomes for patients. Patients follow various websites on the internet about hip impingement syndrome. Academic, commercial, surgeon's private website, websites of the Ministry of Health, etc. are followed.<sup>13-15</sup> Burrus colleagues found that most patients (82.3%) used Google to research their orthopedic conditions, followed by 49.9% using WebMD, and 33.7% the institution's orthopedic website.<sup>16</sup> Similarly, fraval and colleagues reported that 78.2% of patients found their best sources for information about their conditions, including facts, anatomy, techniques, and surgeries through search engines. The availability of online information is increasing patients' access to knowledge about their illnesses.<sup>17</sup> This study examines Google search engine analyses to identify the most frequently asked questions and sources used by hip impingement patients for obtaining information about their condition including facts, anatomy, techniques, and surgeries among others.

Rehabilitation programs after hip impingement repair have been extensively evaluated in the literature.<sup>18-20</sup> Although immobilization and protection with immobilization are important and repair prescriptions are still new, progressive and accelerative physical therapy programs have recently been developed that are thought to reduce pain and stiffness and improve outcomes.<sup>21</sup> However, it has become clearer that no single repair method can be applied to hip impingement repairs, as the morphology and extent of the repair have shown that it will lead to failure if not progressed with the appropriate rehabilitation protocol. Therefore, although social media is a quick and easily accessible platform with an abundance of information about activity after hip impingement repair, patients may not have the necessary knowledge to interpret this information in the context of their clinical picture. Since patients will be hospitalized for a certain period after hip impingement repair surgery, there is plenty of opportunity to ask questions during this time.<sup>22</sup> Misinterpretation and misapplication of this information by patients can lead to unwanted injuries and recurrent hip pain. It is therefore crucial that orthopaedic surgeons take ownership of the information that patients inevitably seek online and on social media, in an understandable format and at an appropriate literacy level. Patients also benefit if orthopaedic surgeons have informative and guiding qualities.

Physiotherapy and rehabilitation in the clinic after FAI surgery can accelerate recovery and alleviate hip pain for certain patients. Additionally, it can enhance the patient's overall well-being by fostering psychological stability.<sup>23</sup> Pain was the second most common question, accounting for 16.7% of all questions asked in this study. This is not surprising as pain is essential for patient satisfaction and is an integral part of postoperative rehabilitation. Musnch et al.<sup>24</sup> published a study in which opioid use reduced pain with sports procedures. Although the expectation of experiencing postoperative pain may cause anxiety about the procedure, orthopaedic surgeons should counsel patients about the pain management strategy they intend to use and its effectiveness. The success of regional nerve blocks, cryotherapy alternative nonopioid protocols, and multidisciplinary treatment have been shown to positively affect the patient's physical therapy and rehabilitation by providing postoperative pain control.<sup>25,26</sup> This study shows that patients search for pain management strategies on the internet, which comes from their desire to find what works best for them without being bound by protocols. There is also evidence that these protocols are inadequate. Pain may occur following FAI treatment. For optimal outcomes, it is advisable to seek guidance and counseling on pain management from an orthopedic surgeon.

Questions regarding the indications for hip impingement are in a common category. Causes of impingement include the abnormal structure of the femur or acetabulum, chronicity of impingement syndrome, athletics, age, strength, and function.<sup>27,28</sup> The decision to repair hip impingement requires an expert orthopaedic surgeon who can comprehensively evaluate the clinical picture including but not limited to patient age, activity level, social factors, comorbidities, degree of labrum tear, progression of the tear, the severity of pain,

location of the glass or pincer, and etiology of the injury.<sup>29,30</sup> This study highlights that, although patients can Google whether or not to undergo surgery, it requires a comprehensive approach that includes a shared decision-making model with the patient to give a patient an indication for FAI treatment and surgery.

### Limitations

There are some limitations to this study. One of them is that an individual's search history may lead to different websites when searching for websites related to our research. Therefore, the data used was extracted using a cleanly loaded web browser. Another limitation is that in cases where scaffold and matrix biomaterials are developed for hip impingement, arthroscopic techniques such as muscle tissue, labrum, and capsule repair are developed, question topics will change on web pages. Additionally, there is the possibility of overlap when categorizing questions according to specific topics. Specific topics have been chosen to define the types of questions asked; however, this limitation is still an important aspect to be recognized.

### CONCLUSION

This study has the most frequently asked questions by patients regarding FAI surgery. The topics that patients were most curious about were postoperative activities, pain management, and surgical indications. The most frequently visited sites were academic and medical practice content, with JAMA scores of moderate qualities. These results suggest that more emphasis should be placed on patient education to meet patients' information needs. A guide called frequently asked questions can be created for orthopedic surgeons to advise patients. Patients can easily access the answers to these questions on the website.

### ETHICAL DECLARATIONS

#### Ethics Committee Approval

Institutional ethics committee approval was not required for this review article.

#### Informed Consent

Because the study was designed retrospectively, no written informed consent form was obtained from patients.

#### Referee Evaluation Process

Externally peer-reviewed.

#### Conflict of Interest Statement

The authors have no conflicts of interest to declare.

#### Financial Disclosure

The authors declared that this study has received no financial support.

#### Author Contributions

All of the authors declare that they have all participated in the design, execution, and analysis of the paper, and that they have approved the final version.

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