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Is YouTube™ a reliable source for patient information about Holmium Laser Enucleation of Prostate?

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INTRODUCTION

Due to the increasing life expectancy, benign prostatic obstruction (BPO) is more and more common since it affects 50 to 75% of men after 50 years old[1]. Lower urinary tract symptoms (LUTS) caused by BPO have a considerable impact on quality of life[2]. Failure of medical treatment and/or the onset of complications indicate surgical treatment of bladder outlet obstruction (BOO). Among surgical options, endoscopic enucleation of the prostate is considered as the most valuable alternative, when available, according to the most recent guidelines[3]. In particular, holmium laser enucleation of the prostate (HoLEP) has shown non-inferiority compared to transurethral resection of the prostate (TURP) for prostates weighing less than 80g, and compared to open prostatectomy (OP) for prostates weighing more than 80g [3], associated with better safety outcomes compared to historical approaches.

Prior to any surgical treatment, the patient's informed consent is mandatory according to the recommendations of the World Health Organization[4]. Some scientific societies, including the French Association of Urology (AFU) and the European Association of Urology (EAU), provide some on-line explanation about LUTS/BPO surgical options and information sheets for urologists to give to their patients [5, 6]. These resources are of course potentially helpful in informing the patient about care pathway, intervention preparation, risk of complications, and follow-up, but information about the surgery itself is somewhat limited to a couple of illustrations for each option.

Nowadays, thanks to a more global access to the Internet, social networks have become a major source of information for the population, even about health topics[7]. One could thus anticipate that patients would seek information on those websites to get accurate information about their scheduled surgery, especially video information. As the historical leader in the field, YouTube™ is a video platform used by more than 2 billion Internet users every month. Every day, one billion hours of videos are watched, generating several billion views[8]. However, the reliability of the information available on this platform is questionable since video sharing is only subject to security and not quality control [9]. Some authors have already evaluated the quality of medical information provided on YouTube™ about various urological pathologies and procedures such as ultrasound-guided prostate biopsies or prostate cancer screening [10, 11].

The aim of this study was to evaluate the quality of the information freely available for patients on YouTube™ regarding HoLEP.

MATERIALS AND METHODS

The study was conducted based on a web-based search in December, 2020. The term “HoLEP” on the YouTube™ search engine was used to find all the videos freely accessible to patients. The following videos were excluded from analysis (as they were not dedicated to patients): specific destination to the medical community, conferences or webinars, and these may not have been understandable by a random patient looking for information before surgery. We also excluded videos showing only endoscopic sequences and operating room organization, isolated surgical advices and comments on the technique, patient installation and instruments presentation, as well as videos not including any written or oral comment. The authors who viewed and collected data from the videos mastered only French, English or Arabic; therefore videos providing information in any other language were also excluded. Patient testimonials based on personal experience were excluded, as well as videos not dealing with HoLEP (homonyms or search engine mistake).

In order to evaluate the quality of the information provided in the selected videos, the patient information sheet by the French Association of Urology (AFU) was used to create a list of 31 items deemed relevant for patient information [6]. These items were grouped into 4 topics (Table 2):

- Anatomy and pathophysiology in 6 items: bladder, urethra, prostate, prostate enlargement, LUTS, and BPO complications.
- Technique and perioperative preparation in 10 items: surgical indication, other surgical alternatives, passage through the urethra, laser use, pathological examination of the material, principles of enucleation, mandatory pre-operative urine culture, hospitalization required; general or spinal anesthesia, and principles of postoperative bladder catheterization.
- Usual outcomes and side effects in 10 items: Bladder catheter for a few days; Catheter related bladder discomfort; Hematuria may persist; No erectile dysfunction; No orgasm deterioration; Retrograde ejaculation; Preventive anticoagulation; Analgesics sometimes necessary; Progressive improvement of LUTS; Storage symptoms may persist after surgery.
- Complications in 5 items: Common complications (bleeding with possible transfusion, thrombosis, allergy); Urinary tract infection; Clot retention; Urinary incontinence; Urethral stricture.

The videos were watched concomitantly by two authors. For each item on the predefined list, correct information was rated 1, missing information was rated 0, and incorrect information was rated -1 to sanction videos with misleading information.

We also collected other data concerning the selected videos: duration, date of publication on YouTube™, number of views, number of "like" and "dislike", country of origin, language, as well as the information format (written, oral or both), the explicit participation of a doctor or even a urologist, and the implementation of surgical sequences and/or animations.

The results for each video have been converted into percentages, for the total score, and for the category-specific scores, allowing to arbitrarily classify the videos according to the quality of the information provided in 5 grades as follows: excellent between 80 and 100%, good between 60 and 80%, acceptable between 40 and 60%, poor between 20 and 40%, and mediocre between 0 and 20%.

Statistical analysis was performed to obtain means, standard deviations, frequencies and percentages. This analysis was performed with the SPSS version 17.0 program. Comparisons of 2 means on independent series were performed using Student's t-test. In all statistical tests, the significance level (p) was set at 0.05.

RESULTS

Primary search retrieved 472 videos. We excluded 18 videos specifically destined to the medical community, 139 videos in languages non currently spoken by the authors (other than French, English or Arabic), 249 videos on pure surgical technique, 9 patient testimonials, and 22 irrelevant videos not dealing with HoLEP. A total of 35 videos were selected for analysis on the basis of the inclusion and exclusion criteria (Figure 1).

The videos cumulated a total of 181,112 views. The mean duration of the videos was $6'6 \pm 7'03$ [00'20; 31'30], with a mean number of 5,279 views $\pm 17,821$ [8; 87,354]. The information provided was written and oral in 51.4% of the videos, oral only in 34.3% of the videos and written only in 14.3% of the videos. Among the displayed videos, 22.9% showed surgery sequences and 40% showed one or more animations. A medical doctor was directly involved in 62% of the videos. English was the most represented language (77%), followed by French (17%) and Arabic (6%). The largest number of videos was from the United States (25.7%), India (20%) and France (17.1%). The other origins of videos were as follow: Israel (5.7%); UK (5.7%); Argentina (2.9%); Australia (2.9%); Belgium (2.9%); Canada (2.9%); Italy (2.9%); Nigeria (2.9%); Syria (2.9%); Trinidad (2.9%) and Turkey (2.9%).

The characteristics of the videos by quality grade are summarized in Table 1. Among these characteristics taken separately, none made a statistically significant difference in the quality score.

The best video scored a total of 81% with only 6 items not mentioned among the 31 defined by the authors based on the AFU information sheet; it lasted 3'28 with both oral and written explanations, and involved animations but no surgical sequence and no doctor.

The mean quality score among the 35 videos analyzed, all topics combined, was 37.3%, with a lowest score at 0%. When analyzed by information topic, "anatomy and pathophysiology" got the highest mean quality score. The lowest mean quality score was for "usual outcomes". On the 2 topics about

"usual outcomes" and "complications", four videos got a negative score, with a minimum score at -20%, because of wrong information (Table 2).

Based on the total quality score of each video as a percentage, only one video was rated "excellent", and 7 videos were rated "mediocre". The majority (57.1%) of the videos were rated between 0 and 40%, which we arbitrarily considered less than acceptable according to the grading scale we used. The most represented grade for the topic "anatomy and pathophysiology" was "excellent", "acceptable" for the topic "technique and perioperative preparation", and "mediocre" for the topics "usual outcomes" and "complications". Among the results by topic, some videos obtained negative quality scores. Table 3 confirms these findings.

Only one of the 35 videos selected mentioned the need to carry out a urine culture before surgery. About the complications, we noticed that short and medium term complications (bleeding with possible transfusion, thrombosis, allergy, urinary tract infection, clot retention) were at least twice more cited than long term complications (urinary incontinence and urethral stricture). Even rarer complications, such as bladder perforation or urethra thermal necrosis, were never cited by any video.

DISCUSSION

Our study showed a poor quality of the information available on YouTube™ for patients about HoLEP, with a mean quality score of 37.3%. This is similar to other studies that have focused on assessing quality of information available on YouTube™ for other diseases. Indeed, in the field of urology, two other studies displayed comparable conclusion about quality of the information delivered on YouTube™ about echo-guided transrectal prostate biopsies and prostate cancer screening, which was deemed as poor for both topics [10, 11]. Other authors came to similar conclusions regarding non urological conditions such as hydrocephalus and Covid-19 [12, 13]. However, Szmuda et al. found YouTube™ information about stroke to be of good quality [14]. This could reflect the growing media coverage and public interest in this condition, given the need for immediate management of stroke. In our study, the information about the condition of BPO and the procedure itself appeared to be more qualitative than the information on the outcomes and complications.

The information provided on anatomy and pathophysiology of BPO was the most complete among all topics on the videos viewed. This could be explained by the need to introduce these notions in order to be able to present the principles of the procedure.

Concerning technique and perioperative preparation, the quality of the information was acceptable but some key elements are very rarely mentioned, such as the pathological examination of enucleated

tissue, the need for preoperative urine analyses and the various options available for anesthesia. A lack of information on this topic was also noted by Jain et al [10].

Overall, information about the postoperative period was poor. Some videos gave even more false or misleading information than correct information, leading to a negative score for the topics concerned. This was again demonstrated for prostate biopsies by the team of Jain et al [10]. These findings could be explained by the unwillingness to discuss the side effects and possible longer-term complications of HoLEP surgery.

The quality of videos on all types of surgical treatment of lower urinary tract symptoms associated with benign prostatic hyperplasia were assessed by Betschart et al. Similar results were found. The median overall quality of the videos was low and only 21 videos (13.2%) were rated as containing no misinformation [15].

Yang et al. aimed to assess the educational value of surgical videos from the YouTube™ platform about Thulium Laser Enucleation of the Prostate (ThuLEP). Their methodology was similar to ours, as they created a check-list based on LAParoscopic surgery Video Educational Guidelines. They concluded that the majority of the 70 videos included had a low educational value. Even if they evaluated videos especially dedicated to the medical community, their results were similar to ours [16].

The first strength of this study was the selection from all the videos responding to the keyword HoLEP on the YouTube™ search engine. In addition, the criteria used to evaluate the quality of information provided by the videos were chosen from an official document of a scientific society intended for patients. The videos were viewed and evaluated by two authors, limiting the risk of error in the attribution of scores. Videos transmitting misleading information were sanctioned through the scoring method used, making it possible to distinguish between simply missing information and misleading information, which is much more harmful in the context of providing proper information to patients.

The main limitation of this study was the low number of videos meeting the inclusion criteria, which is in itself a result showing the few number of videos considered accessible to a patient on YouTube™ about HoLEP. We may also argue than these findings exclusively interested Holmium laser, and didn't involve other existing laser technologies for endoscopic enucleation of prostate, such as Thulium or Greenlight. Moreover, using "HoLEP" as the only keyword may have created a selection bias.

The information available on YouTube™ about HoLEP was not of sufficient quality to allow patients to give informed consent, and was occasionally misleading. It is the surgeons' responsibility to provide as much information as possible, and possibly to refer patients to reliable sources of information.

Solutions are or will be available to outrun the misinformation. Stacy Loeb mentioned some of them in her letter *Fake news about benign prostatic hyperplasia on YouTube*, such as machine learning to help filter the quality of online content [17].

In today's world of social networking, it may be advisable for scientific societies to develop a video format as a support for patient information.

Based on the experience gained from watching these videos, we propose some advice for the possible development of informative videos:

- Concise video
- Use of written and oral information
- Use of animations
- Video based on a pre-established information sheet that must be available for reading
- Explanations about usual outcomes and complications should take a significant part of the video.

DECLARATION OF INTERESTS:

The authors have no conflict of interest to declare.

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None.

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472 Eligible
videos

437 Excluded videos

18 destined to medical community

139 in a foreign language

249 showing only surgical images

81 with comments

168 with no oral/written comment

9 patient testimonials

22 unrelated to HoLEP

35 videos included for
final analysis

	Mediocre	Poor	Acceptable	Good	Excellent
Number of views, <i>mean ± SD</i> [<i>min ; max</i>]	1390 ± 2670 [9 ; 7229]	7658 ± 23972 [29 ; 87354]	570 ± 721 [30 ; 2075]	14069 ± 27668 [30 ; 63302]	8 ± 0 [8 ; 8]
Opinion, <i>mean ± SD</i> [<i>min ; max</i>]					
Number of "likes"	6 ± 11 [0 ; 30]	30 ± 86 [0 ; 316]	2 ± 2 [0 ; 6]	51 ± 96 [0 ; 221]	0 ± 0 [0 ; 0]
Number of "dislikes"	0 ± 1 [0 ; 2]	3 ± 9 [0 ; 33]	0 ± 0 [0 ; 0]	7 ± 14 [0 ; 31]	0 ± 0 [0 ; 0]
Video duration, <i>mean ± SD</i> [<i>min ; max</i>]	1'09 ± 0'52 [0'20 ; 2'56]	3'46 ± 3'22 [0'59 ; 13'00]	7'25 ± 4'59 [1'54 ; 15'52]	7'43 ± 5'11 [0'48 ; 12'40]	3'28 ± 0'00 [3'28 ; 3'28]
Information format, <i>n (%)</i>					
Oral only	2	6	4	0	0
Written only	2	2	0	1	0
Both oral and written	3	5	5	4	1
Animation	3	5	1	4	1
Surgical sequence	1	3	3	1	0
Doctor involved, <i>n (%)</i>	3	9	9	1	0

Table 1. Analysis of general attributes of videos according to their quality grade.

Information topic (number of items)	Items	Score (%) mean±SD[min;max]
Anatomy and Physiopathology (6)	Bladder Urethra Prostate Prostate Enlargement Low Urinary Tract Symptoms (LUTS) Prostatic hyperplasia complications	61,4 ±27,6 [17;100]
Procedure and Preparation for procedure (10)	Surgery indication Other surgical alternatives Passage through the urethra Laser use Anatomopathological examination Adenoma enucleation only Mandatory sterile pre-operative urine Hospitalization required General or spinal anesthesia Postoperative bladder catheterization	49,6 ±21,6 [6;90]
Usual outcomes and Side effects (10)	Bladder catheter for a few days Catheter related bladder discomfort Hematuria may persist No erectile dysfunction No orgasm deterioration Retrograde ejaculation Preventive anticoagulation Analgesics are sometimes necessary Progressive improvement of LUTS Storage symptoms may persist after surgery	18,3 ±26,6 [-20;70]
Complications (5)	Common complications Urinary tract infection Clot retention Urinary incontinence Urethral stricture	20 ±29,5 [-20;100]
Total Score	37,3±21,3 [0;81]	

Table 2. Overall and topic-specific scores of all viewed videos.

	Anatomy and Physiopathology	Procedure and Preparation for procedure	Usual outcomes and Side effects	Complications	All Items
Mediocre, n	3	3	24	28	7
0 to 20 % score	3	3	21	27	7
Less than 0% score	0	0	3	1	0
Poor, n	8	11	4	2	13
Acceptable, n	5	12	3	0	9
Good, n	7	6	4	4	5
Excellent, n	12	3	0	1	1

Table 3. Distribution of videos according to the quality score by topic.