Educational Value of YouTube Surgical Videos of Thulium Laser Enucleation of The Prostate (ThuLEP): The Quality Assessment

Kunlin Yang
Department of Urology, Peking University First Hospital; Institute of Urology, Peking University; National Urological Cancer Center

Yisen Meng
Department of Urology, Peking University First Hospital; Institute of Urology, Peking University; National Urological Cancer Center

Kai Zhang (Kaizhangpku@163.com)
Department of Urology, Peking University First Hospital; Institute of Urology, Peking University; National Urological Cancer Center

Research Article

Keywords: benign prostatic hyperplasia, thulium laser enucleation of the prostate, quality assessment, surgical education, YouTube

Posted Date: February 19th, 2021

DOI: https://doi.org/10.21203/rs.3.rs-218671/v1

Abstract

Objective: To assess the educational value of YouTube surgical videos of thulium laser enucleation of the prostate (ThuLEP).

Design: A comprehensive search of “ThuLEP” or “thulium laser enucleation of the prostate” was carried out on YouTube on October 31th, 2020. According to the LAParoscopic surgery Video Educational GuidelineS, we created a checklist to assess the educational value of these videos. The checklist included 20 options. Each option represented one point. The total score was the sum of all the points. The higher score represents the higher educational value.

Results: A total of 70 videos were included. The average number of views were 1366 (range 11-30884). The mean video length was 16.59 mins (range 1.20-70.35 mins). Only 22.9% (16/70) videos had audio or/and written commentary in English language. Although 67.4% (47/70) videos were present step by step, only 21.4% (15/70) videos did the detailed explanation of critical steps. The mean score of the videos was 5.5 points (range 1-15). No videos met all the points of the checklist. The mean percentage conformity of the videos was 28% (rang 5%-75%). The educational score of the videos had no significant positive correlation with the number of views.

Conclusion: The majority of ThuLEP videos on YouTube platform have a low educational value. Videos often lack important and detailed explanations about surgical procedure. These findings remind us that a global effort should be made to improve the educational value of YouTube surgical videos, and more reporting guidelines are still needed.

Competencies

Patient Care; Professionalism; Practice-Based Learning and Improvement; Online self-learning

Introduction

Surgical videos are very important educational tool for medical students, residents and trainees and senior surgeons. With the development of internet, high-definition video recording and portable electronic devices, the online surgical videos are becoming the part of medical education resources [1, 2]. Videos containing pictures and words/audios may facilitate learning process and understanding complex surgical procedures for beginners [1]. YouTube has been the most widely used video platform in preparation for surgical procedures [3, 4].

In 2010, the Thulium laser enucleation of the prostate (ThuLEP) was firstly reported by Herrmann et al. which is one of enucleating techniques for benign prostatic hyperplasia [5]. ThuLEP mainly focused on mechanical blunt dissection of the transitional zone [5, 6]. Some studies have shown that about 30 cases may be enough for overcoming the learning curve with the help of a simulator [7–9].

There are many surgical videos of ThuLEP uploaded to the YouTube platform by individual surgeons, academic societies, hospitals or commercial companies. Due to lacking of peer review and quality assessment, the educational value of these videos is still uncertain. The high educational quality of videos can facilitate learning and the poor educational quality of videos may mislead the learners. Studies have shown that trainees preferred to the videos with rich educational content [4].

As far as we know, there is a published consensus statement about how to report a laparoscopic surgical video for educational purposes which is known as the LAParoscopic surgery Video Educational GuidelineS (LAP-VEGaS) [10]. However, there is still no a guideline for reporting educational videos of urological endoscopic surgeries.

The purpose of this study is to assess the educational value of YouTube surgical videos of ThuLEP. Moreover, this study may promote us to create an ideal educational video checklist for ThuLEP surgery. We hypothesize that the number of views may not be related to the educational value of the video. This study will also help the beginners to identify the valuable videos of ThuLEP from YouTube platform.

Materials And Methods

This study focused on the evaluation of public-domain videos on ThuLEP surgery. Therefore, no ethical approval is required. A comprehensive search was carried out on YouTube (https://www.youtube.com) on October 31th, 2020 by using the search terms “thulium laser enucleation of the prostate” and “ThuLEP”. The videos were collected by one author based on the following inclusion criteria: enucleation of the prostate must be performed by thulium laser, live surgery recorded by endoscopic camera (no schematized video, cartoon, or multiple surgeries), professional videos made by professionals (not promotional videos or commercial advertisements), English language. Any video that was not meet these inclusion criteria was excluded.

According to the LAP-VEGaS practice guidelines [10], we invited two surgeons who have the experience of more than 100 cases of ThuLEP surgeries to create a novel checklist (Table 1) for reporting videos of ThuLEP surgeries which including the essential educational contents to be shown in videos, such as authors’ information, case presentation, demonstration of the critical procedures, outcomes and image quality of videos. The critical domains of the surgery referred to the techniques reported by Herrmann et al. [5, 11]. The reporting checklist included 20 options. Each option represented one point. The total score was the sum of all the points. The higher score represents the higher educational value.

Table 1
The checklist for the evaluation of ThuLEP surgical videos' educational value.

Items of the checklist	n	(%)
Authors' Information and Video Introduction		
(1) Authors' information	33	(47.1%)
(2) The title of the video including the procedure	60	(85.7%)
(3) Conflict of interest disclosure	0	0
Case presentation		
(4) Patient anonymity and privacy protection	69	(98.6%)
(5) Baseline patient characteristics	10	(14.3%)
(6) Preoperative work-up and treatments	3	(4.3%)
(7) The volume of prostate before surgery	23	(32.9%)
Demonstration of the surgical procedure		
(8) The introduction of the laser equipment	13	(18.6%)
(9) The setting of laser power	11	(15.7%)
(10) Anatomic demonstration	51	(72.9%)
(11) In a standardized step by step fashion	47	(67.1%)
(12) Detailed explanation of critical steps	15	(21.4%)
Outcome of procedure		
(13) The operating time	4	(5.7%)
(14) The weight of the prostatic specimen	6	(8.6%)
(15) The length of hospitalization	3	(4.3%)
(16) The morbidity of intraoperative and postoperative complications	3	(4.3%)
(17) Functional outcomes	6	(8.6%)
Associated educational content		
(18) Diagrams, photos, snapshots or tables	9	(12.9%)
Audio/written commentary in English language		
(19) Only A	1	(1.4%)
(20) Only W	9	(12.9%)
A and W	6	(8.6%)
A, audio commentary; W, written commentary		

All videos were firstly reviewed for inclusion criteria, the reporting checklist by first author. The baseline characteristics of included videos were collected. Then, two surgeons who created the checklist simultaneously evaluated the conformity

to the reporting checklist.

Data analysis was performed with SPSS Statistics (Version 22 for Windows, IBM Corporation). Continuous variables were shown as Means, ranges, standard deviations (SD). The Pearson's correlation coefficient was used to evaluate the correlations among variables. Correlation is significant at the $p < 0.05$ level.

Results

A total of 70 videos of ThuLEP which met the inclusion criteria were identified. The characteristics of the videos are shown in Table 2. The median time available online was 1120.5 days (range 18-3427 days). The oldest videos were uploaded in 2011 and the newest videos uploaded in 2020. The average number of views were 1366 (range 11-30884, SD 3848). The Fig. 1 shows the countries' distribution of the authors. The image quality was rated as high for 34 (48.6%) videos, as moderate for 19 (27.1%) and as low for 17 (24.3%). The mean video length was 16.59 mins (range 1.20-70.35 mins, SD 14.29). The mean number of likes and dislikes per video was 4.9 (range 0–55) and 0.4 (range 0–9). All except one channel of the videos allowed the viewers to comment. Thirty-six videos (51.4%) were uploaded by individual channel. Twenty-three videos (32.9%) were uploaded by academic institutions of hospitals and 11 videos (15.7%) were uploaded by commercial companies. Several surgeons uploaded a series of videos about ThuLEP.

Table 2
Characteristic of the 70 reviewed surgical videos on ThuLEP on YouTuBe (The data were collected on October 31, 2020).

No.	Title	Date of upload	Days online	Country	IQ (L / M / H)	Views	Length / min	No. of likes	No. of dislikes	Scores n (%)
1	thulep EAU 2019 1080p	2019/6/28	491	France	H	983	8.02	3	0	15 (75%)
2	THULEP Barcelona	2018/4/20	925	France	H	678	8.00	3	0	15 (75%)
3	Thulium enucleation en bloc 100 g	2018/4/26	919	France	H	97	10.70	1	0	15 (75%)
4	BPH - Pulsed Thulep	2013/11/22	2535	Italy	M	791	9.55	1	0	13 (65%)
5	Thulium Laser Enucleation - San Donato (MI) - (Cyber TM - Quanta System)	2012/9/7	2976	Italy	L	6350	6.50	9	2	11 (55%)
6	Thulium Enucleation of the Prostate for 130g adenoma	2017/4/13	1297	France	H	1316	10.00	7	1	10 (50%)
7	Thulium Laser Enucleation of the Prostate (ThuLEP)	2015/4/24	2017	USA	L	3261	7.37	6	1	10 (50%)
8	Thulium laser enucleation of huge prostate 150 gm, step by step	2019/10/10	387	Taiwan (CHN)	H	441	9.15	4	0	10 (50%)
9	Thulium laser enucleation of the prostate (ThuLEP) "en bloc" technique by Dr. Rijo	2018/3/24	952	Spain	H	2154	22.95	11	2	8 (40%)
10	THULEP (THUlium Laser Enucleation of Prostate) after only partial transurethral resection	2017/5/7	1273	UAE	M	617	3.53	13	0	8 (40%)

No.	Title	Date of upload	Days online	Country	IQ (L / M / H)	Views	Length / min	No. of likes	No. of dislikes	Scores n (%)
11	Enbloc Thulium Laser Enucleation of Prostate (ThuLEP) (Edited)	2020/10/13	18	Egypt	L	557	6.53	40	0	8 (40%)
12	ThuLEP with Cyber TM - two piece technique (Dr. Jung-Yao Huang)	2017/7/4	1215	Taiwan (CHN)	M	463	4.05	6	0	8 (40%)
13	ThuLEP with Cyber TM - One Piece Technique (Dr. Jung-Yao Huang)	2017/7/4	1215	Taiwan (CHN)	M	407	6.67	4	0	8 (40%)
14	A novel one lobe technique of ThuLEP: 'All-in-One' technique	2015/10/19	1839	South Korea	M	1073	9.40	1	0	8 (40%)
15	Thulium Laser Enucleation of Prostate (THULEP)	2017/11/12	1084	UAE	M	1903	3.90	16	0	7 (35%)
16	Cyber TM ThuLEP Procedure	2018/10/12	750	Unknown	L	437	3.97	1	0	7 (35%)
17	BPH THuLEP ShuTien Jung Yao Huang - Thulium Laser - Cyber TM	2014/11/28	2164	Taiwan (CHN)	L	4514	36.87	7	1	7 (35%)
18	BPH - Thulium Enuceation of Prostate	2011/6/14	3427	Unknown	L	3355	3.97	1	1	7 (35%)
19	ThuFLEP. Thulium-fiber laser enucleation of a small adenoma.	2020/4/16	198	Russia	M	93	7.18	1	0	7 (35%)
20	Thulium laser enucleation of prostate (ThuLEP en bloc) - full length, PV: 95 ml	2018/3/9	967	Taiwan (CHN)	L	1124	35.12	5	0	6 (30%)

No.	Title	Date of upload	Days online	Country	IQ (L / M / H)	Views	Length / min	No. of likes	No. of dislikes	Scores n (%)
21	Enucleation of prostate adenoma with cyber TM thulium 150 (Path 1) Dr. Farid Gadimaliyev	2014/11/23	2169	Azerbaijan	H	376	12.50	2	0	6 (30%)
22	ThuLEP 200 cc prostate and holmium laser cystolithotripsy, Dr. Farid Gadimaliyev, Baku, Azerbaijan	2015/3/6	2066	Azerbaijan	H	338	21.70	0	0	6 (30%)
23	Thulium Laser Enucleation (90cc) - Varese Hospital	2012/12/1	2891	Italy	L	3901	5.87	5	1	6 (30%)
24	ThuFLEP. Thulium-fiber laser enucleation of the prostate: 90 cc in 25 minutes! No editing	2020/4/25	189	Russia	L	698	28.95	25	1	6 (30%)
25	Thulium fiber laser enucleation of the prostate: 165 cc in 45 min	2020/10/8	23	Russia	L	108	47.48	5	0	6 (30%)
26	Laserowa Enukleacja Prostaty ThuLEP	2015/2/27	2073	Unknown	M	464	22.12	3	0	6 (30%)
27	Thulium laser enucleation of the prostate with en bloc technique (ThuLEP en bloc) - full length	2017/5/16	1264	Taiwan (CHN)	M	4732	37.72	25	0	5 (25%)
28	Case history: Benign Prostate Enlargement or Hypertrophy (BPH)	2017/5/2	1278	UAE	M	470	3.45	9	0	5 (25%)

No.	Title	Date of upload	Days online	Country	IQ (L / M / H)	Views	Length / min	No. of likes	No. of dislikes	Scores n (%)
29	ThuLEP (Thulium Laser Enucleation of Prostate) - Prof. C. Imbimbo (Naples - Italy))	2014/7/15	2300	Italy	L	6614	7.92	8	1	5 (25%)

Table 2
Characteristic of the 70 reviewed surgical videos on ThuLEP on YouTuBe (The data were collected on October 31th, 2020) *(Continued)*

No.	Title	Date of upload	Days online	Country	IQ (L / M / H)	Views	Length / min	No. of likes	No. of dislikes	Scores n (%)
30	Thulium laser enucleation of the prostate, Dr. Farid Gadimaliyev	2014/11/24	2168	Azerbaijan	M	125	6.85	0	0	5 (25%)
31	Simultaneous Thulep and hernioplasty. Dr. Farid Gadimaliyev, Customs Hospital, Baku, Azerbaijan	2015/1/9	2122	Azerbaijan	H	55	33.22	2	0	5 (25%)
32	ThuLEP under TRUS guidance, Dr. Farid Gadimaliyev, Customs Hospital, Baku, Azerbaijan	2015/3/12	2060	Azerbaijan	H	99	13.33	1	0	5 (25%)
33	ThuLEP after TURP failure, Dr. Farid Gadimaliyev, Customs Hospital, Baku, Azerbaijan	2015/3/9	2063	Azerbaijan	H	319	20.63	1	0	5 (25%)
34	ThuLEP simultaneous with tulium laser ureterotomy and holmium laser lithotripsy. Dr. Farid G.	2015/3/6	2066	Azerbaijan	H	234	14.58	2	0	5 (25%)
35	ThuLEP (thulium laser prostate enucleation) after failed TURP,with ultrasound guidance, Dr. Farid G.	2015/4/29	2012	Azerbaijan	H	708	20.28	1	0	5 (25%)

No.	Title	Date of upload	Days online	Country	IQ (L / M / H)	Views	Length / min	No. of likes	No. of dislikes	Scores n (%)
36	ThuLEP performed simultaneously with open nephrectomy and bladder stones, Dr.Farid Gadimaliyev	2015/4/21	2020	Azerbaijan	H	265	14.18	1	0	5 (25%)
37	ThuLEP with Ultrasound Guidance, Dr. Farid Gadimaliyev, Customs Hospital, Baku, Azerbaijan	2015/4/3	2038	Azerbaijan	H	103	22.18	1	0	5 (25%)
38	ThuLEP with dynamic ultrasound evaluation, Dr. Farid Gadimaliyev, Customs Hospital, Baku, Azerbaijan	2015/4/11	2030	Azerbaijan	H	168	23.98	1	0	5 (25%)
39	Enucleation of prostate adenoma with cyber TM thulium 150 (Path 2) Dr. Farid Gadimaliyev	2014/11/23	2169	Azerbaijan	H	117	15.27	2	0	5 (25%)
40	ThuLEP Thulium-Y.A.G. Enucleation of Prostate	2014/4/20	2386	Taiwan (CHN)	L	1431	28.15	0	0	5 (25%)
41	7U Thulep - prezentarea tehnicii de enucleere prostatica cu laser Thulium	2020/7/21	102	Unknown	M	55	3.00	0	0	5 (25%)
42	Prostata con laser ThuLEP	2017/11/11	1085	Unknown	M	397	6.92	1	0	5 (25%)
43	Thulium Laser Prostatectomy to 142 cc prostate Full Length Video	2019/6/27	492	Turkish	M	1223	70.35	11	1	4 (20%)

No.	Title	Date of upload	Days online	Country	IQ (L / M / H)	Views	Length / min	No. of likes	No. of dislikes	Scores n (%)
44	Laser prostate surgery - Complete thulium laser enucleation, Dr. Farid Gadimaliyev	2015/7/2	1948	Azerbaijan	H	30884	16.90	55	9	4 (20%)
45	201712 Vela Enucleation TRUS 63cc ThuLEP	2018/1/23	1012	Taiwan (CHN)	H	215	45.17	2	0	4 (20%)
46	201711 ThuLEP TRUS 50cc s/p Warfarin	2018/1/23	1012	Taiwan (CHN)	H	119	19.83	1	0	4 (20%)
47	201703 Vela Enucleation ThuLEP TRUS 86.9gms	2018/1/10	1025	Taiwan (CHN)	H	222	28.98	2	0	4 (20%)
48	201712 Vela 001 ThuLEP TRUS 40cc	2018/1/10	1025	Taiwan (CHN)	H	56	22.42	0	1	4 (20%)
49	THULEP	2011/11/24	3264	Unknown	L	1859	2.58	2	0	4 (20%)
50	THULEP-THULIUM LASER PROSTATE SURGERY	2019/10/28	369	Unknown	H	152	4.97	2	0	4 (20%)
51	ThuLEP 25min	2020/7/23	100	Taiwan (CHN)	H	230	29.45	0	0	4 (20%)
52	ThuLEP. EndoUroCenter	2020/1/5	300	Unknown	H	26	66.00	0	0	4 (20%)
53	Cistolitotrissia endoscopica ed enucleazione adenoma prostatico con Laser a Thullio (ThuLEP)	2017/10/7	1120	Unknown	M	272	10.38	1	0	4 (20%)
54	Laser enucleation of prostate	2017/10/20	1107	Taiwan (CHN)	H	542	10.47	3	0	4 (20%)
55	THULEP	2011/11/25	3263	Unknown	L	1856	2.58	2	0	3 (15%)

No.	Title	Date of upload	Days online	Country	IQ (L / M / H)	Views	Length / min	No. of likes	No. of dislikes	Scores n (%)
56	201710 Cyber-TM Enucleation ThuLEP	2018/1/10	1025	Taiwan (CHN)	H	223	27.88	5	0	3 (15%)
57	201712 Vela 003 Enucleation	2018/1/10	1025	Taiwan (CHN)	H	75	30.97	1	0	3 (15%)
58	201611 Vela Prostatectomy Enucleation TRUS 82cc	2018/1/9	1026	Taiwan (CHN)	H	55	18.15	2	0	3 (15%)

Table 2

Characteristic of the 70 reviewed surgical videos on ThuLEP on YouTuBe (The data were collected on October 31th, 2020) *(Continued)*

No.	Title	Date of upload	Days online	Country	IQ (L / M / H)	Views	Length / min	No. of likes	No. of dislikes	Scores n (%)
59	Thulium Laser Enucleation of Prostate (revolix) Enucleoresezione Prostatica Laser Tullio ThuLEP	2013/11/5	2552	Italy	L	1764	14.57	2	1	3 (15%)
60	Thulium Laser Enucleation (ThuLEP) of the Prostate	2020/6/24	129	Unknown	M	116	18.40	1	0	2 (10%)
61	201710 Vela	2018/1/10	1025	Taiwan (CHN)	H	58	13.80	3	1	2 (10%)
62	Enucleazione Laser Adenoma della prostata THULEP	2015/3/18	2054	Unknown	L	1066	21.65	0	0	2 (10%)
63	ThuLEP	2018/8/28	795	Unknown	H	299	1.53	0	0	2 (10%)
64	(ThuLEP)	2018/1/22	1013	Unknown	H	732	1.20	4	0	2 (10%)
65	(ThuLEP)	2018/3/13	963	Unknown	M	450	2.90	3	1	2 (10%)
66	THULEP	2017/10/6	1121	Unknown	M	107	5.22	2	0	2 (10%)
67	Thulium laser enuleation of prostate	2017/6/10	1239	Taiwan (CHN)	H	511	29.57	1	1	2 (10%)
68	Thulium laser enucleation for prostate hyperplasia	2019/11/7	359	Taiwan (CHN)	L	41	5.13	0	0	2 (10%)
69	Thulium laser enucleation of the prostate.	2020/5/3	181	India	H	11	6.17	0	0	2 (10%)
70	THUFLEP Laser Enucleation of Prostate	2020/6/16	137	Unknown	M	80	10.40	3	0	1 (5%)

ThuLEP, thulium laser enucleation of the prostate; IQ (L / M / H), image quality (low / moderate / high).

After two authors' simultaneously review, the evaluation of the videos' educational value was completed. Only 22.9% (16/70) videos had audio or/and written commentary in English language. Audio commentary alone was present in 1.4% (1/70) of the videos. Written commentary alone was present in 12.9% (9/70) of the videos. Six videos (8.6%) contained audio and written educational content. The patients' privacies were protected in 98.6% (69/70) of the videos. However, the patients' characteristics were introduced in 14.3% videos and the preoperative volume of the prostate was reported in 32.9% (23/70). Anatomic landmark was shown in 72.9% (51/70) videos. Although 67.4% (47/70) videos were present step by step, only 21.4% (15/70) videos did the detailed explanation of critical steps. The 3-lobe, 2-lobe, and en bloc enucleation were respectively present in 44.3% (31/70), 24.3% (17/70) and 31.4% (22/70) of the videos. Most of the videos had no the outcomes of procedures.

The mean score of the videos was 5.5 points (range 1–15, SD 3.1). No videos met all the points of the checklist. Three videos which were uploaded by UROLOGIE SAINT AUGUSTIN had the highest score of 15 points. One of these three videos was shown in European Association of Urology Annual Congress of 2019. This channel also uploaded a series videos about urological surgeries. The mean percentage conformity of the videos was 28% (rang 5%-75%).

Correlation test showed that the number of views had significantly positive correlation with online days and number of likes ($r = 0.718$, $p < 0.01$) and dislikes ($r = 0.935$, $p < 0.01$). Although the number of views had negative relationship with video length, the correlation was not significant. The educational score of the videos had no significant positive correlation with the number of views (Table 3).

Table 3
Correlation test for the factors influencing the views.

		1	2	3	4	5	6
1	Views	1					
2	Days online	**0.250***	1				
3	Video length	**-0.016**	-0.179	1			
4	No. of likes	**0.718****	-0.09	0.045	1		
5	No. of dislikes	**0.935****	0.163	0.03	0.681**	1	
6	Educational score	**0.029**	0.082	-0.177	0.101	-0.008	1
* Correlation is significant at the 0.05 level (2-tailed).							
** Correlation is significant at the 0.01 level (2-tailed).							

Discussion

This study reports the educational evaluation of surgical videos of ThuLEP on YouTube on October 31, 2020. These videos were available on Youtube for a mean of 3.1 years and were watched by worldwide trainees, residents or any beginners. Considering these videos have the potential educational value and enormous influence, a quality assessment of these videos may be essential and reasonable for trainees. To our knowledge, this is the first quality assessment for YouTube surgical videos of ThuLEP. Meanwhile, we firstly reported the evaluation checklist for an educational video of ThuLEP.

Watching videos is a good method for surgical learning, especially for learning of minimal invasive endoscopic surgeries. Some studies have revealed that YouTube is the most frequently used video source for surgical learning and preparation [3, 4, 12]. However, without the peer review and quality assessment, some studies have revealed that

YouTube is not a reliable education or information resource [13–16]. This reminds us that the quality assessment of surgical videos is necessary when we use them as the educational tool.

In laparoscopic surgical education, LAP-VEGaS is a good example for producing an educational video with logical structure [10, 15]. These guidelines can improve the educational value of surgical videos. So, we assume that the similar requirement for reporting educational videos of urological endoscopic surgeries is also useful. Although there is no a published evaluation checklist for ThuLEP videos, we invited two experienced surgeons to create an initial vision of this checklist (Table 1).

In our study, we found that the most popular videos didn't have the highest educational value. In contrast, the highest valued videos were not the most popular videos. The correlative analysis proved that educational score of the videos had no correlation with the number of views. It's an interesting phenomenon which is in accordance with other studies [3, 13, 17–19].

We have noted that many urological journals have video section which encourage authors to submit videos. Very few journals are open access. Most of them are not free. There were two videos of ThuLEP surgery published in Videourology which were made by some experts in this filed [20, 21]. Only after buying them we can see the videos. We also found that one of the reviewed videos had been published in Urology Video Journal which is an open access journal [22]. The European Association of Urology and the American Urological Association both have the video libraries. But they are only open for registered members or eligible learners.

There are some inevitable limitations in this study. We only evaluated the ThuLEP videos on YouTube platform, since it has been the most frequently used educational video source for residents and trainees. We only search the videos with English language. No doubt the selective bias exists. Because the authors may upload their videos with non-English language, and the YouTube is an open platform, the new videos will be uploaded and the old videos may be removed. Meanwhile, there is still no a generally accepted consensus for reporting an educational video about ThuLEP. The checklist that we created must be approved by more experts. Although YouTube is public and non-academic video platform, more requirement for uploading surgical videos may improve its educational value.

Conclusions

Despite the YouTube is the most frequently used educational video source for surgical learning, the majority videos of ThuLEP have a low educational value. Videos often lack important and detailed explanations about surgical procedure. This reminds us that a global effort should be made to improve the educational value of YouTube surgical videos and more reporting guidelines are needed.

Abbreviations

Thulium laser enucleation of the prostate = ThuLEP

LAParoscopic surgery Video Educational GuidelineS = LAP-VEGaS

Standard deviations = SD

Declarations

Ethics approval and consent to participate:

No ethical approval is required.

Consent for publication:

Not applicable.

Availability of data and materials:

All data generated or analysed during this study are included in this published article.

Competing interests:

All authors have no competing interests.

Funding:

None.

Authors' contributions:

Kai Zhang designed the concept and revised the manuscript. Kai Zhang and Yisen Meng evaluated the videos. Kunlin Yang and Yisen Meng collected the data and wrote the manuscript.

Acknowledgements:

We are appreciated to receive the suggestions from the editors and the reviewers.

References

1. Pugh CM, Watson A, Bell RJ, et al. Surgical education in the internet era. J SURG RES. 2009 2009-10-01: **156**:177-82
2. Glass NE, Kulaylat AN, Zheng F, et al. A national survey of educational resources utilized by the Resident and Associate Society of the American College of Surgeons membership. AM J SURG. 2015 2015-01-01: **209**:59-64
3. Rapp AK, Healy MG, Charlton ME, Keith JN, Rosenbaum ME, Kapadia MR. YouTube is the Most Frequently Used Educational Video Source for Surgical Preparation. J SURG EDUC. 2016 2016-11-01: **73**:1072-6
4. Mota P, Carvalho N, Carvalho-Dias E, Joao CM, Correia-Pinto J, Lima E. Video-Based Surgical Learning: Improving Trainee Education and Preparation for Surgery. J SURG EDUC. 2018 2018-05-01: **75**:828-35
5. Herrmann TR, Bach T, Imkamp F, et al. Thulium laser enucleation of the prostate (ThuLEP): transurethral anatomical prostatectomy with laser support. Introduction of a novel technique for the treatment of benign prostatic obstruction. WORLD J UROL. 2010 2010-02-01: **28**:45-51
6. Kyriazis I, Swiniarski PP, Jutzi S, et al. Transurethral anatomical enucleation of the prostate with Tm:YAG support (ThuLEP): review of the literature on a novel surgical approach in the management of benign prostatic enlargement. WORLD J UROL. 2015 2015-04-01: **33**:525-30
7. Saredi G, Pirola GM, Pacchetti A, et al. Evaluation of the learning curve for thulium laser enucleation of the prostate with the aid of a simulator tool but without tutoring: comparison of two surgeons with different levels of endoscopic experience. BMC UROL. 2015 2015-06-09: **15**:49
8. Herrmann T, Gravas S, de la Rosette JJ, Wolters M, Anastasiadis AG, Giannakis I. Lasers in Transurethral Enucleation of the Prostate-Do We Really Need Them. J CLIN MED. 2020 2020-05-10: **9**
9. Netsch C, Bach T, Herrmann TR, Neubauer O, Gross AJ. Evaluation of the learning curve for Thulium VapoEnucleation of the prostate (ThuVEP) using a mentor-based approach. WORLD J UROL. 2013 2013-10-01: **31**:1231-8

10. Celentano V, Smart N, McGrath J, et al. LAP-VEGaS Practice Guidelines for Reporting of Educational Videos in Laparoscopic Surgery: A Joint Trainers and Trainees Consensus Statement. ANN SURG. 2018 2018-12-01: **268**:920-6
11. Herrmann T, Wolters M. Transurethral anatomical enucleation of the prostate with Tm:YAG support (ThuLEP): Evolution and variations of the technique. The inventors' perspective. ANDROLOGIA. 2020 2020-09-01: **52**:e13587
12. Celentano V, Smart N, Cahill RA, et al. Use of laparoscopic videos amongst surgical trainees in the United Kingdom. Surgeon. 2019 2019-12-01: **17**:334-9
13. Betschart P, Pratsinis M, Mullhaupt G, et al. Information on surgical treatment of benign prostatic hyperplasia on YouTube is highly biased and misleading. BJU INT. 2020 2020-04-01: **125**:595-601
14. Tanwar R, Khattar N, Sood R, Makkar A. [Benign prostatic hyperplasia related content on YouTube: unregulated and concerning]. Recenti Prog Med. 2015 2015-07-01: **106**:337-41
15. Haslam RE, Seideman CA. Educational Value of YouTube Surgical Videos of Pediatric Robot-Assisted Laparoscopic Pyeloplasty: A Qualitative Assessment. J ENDOUROL. 2020 2020-11-01: **34**:1129-33
16. De'Angelis N, Gavriilidis P, Martinez-Perez A, et al. Educational value of surgical videos on YouTube: quality assessment of laparoscopic appendectomy videos by senior surgeons vs. novice trainees. WORLD J EMERG SURG. 2019 2019-01-20: **14**:22
17. Loeb S, Sengupta S, Butaney M, et al. Dissemination of Misinformative and Biased Information about Prostate Cancer on YouTube. EUR UROL. 2019 2019-04-01: **75**:564-7
18. Staunton PF, Baker JF, Green J, Devitt A. Online Curves: A Quality Analysis of Scoliosis Videos on YouTube. Spine (Phila Pa 1976). 2015 2015-12-01: **40**:1857-61
19. Jones M, Wiberg A. Evaluating Youtube as A Source of Patient Information on Dupuytren's Disease. World J Plast Surg. 2017 2017-09-01: **6**:396-8
20. Imkamp F, Hannover, Bach T, Gross AJ, Herrmann TRW. Thulium Laser Enucleation of the Prostate: Five Steps to Surgical Success. Videourology. 2011:
21. Omar M. Thulium Laser Enucleation of the Prostate: Median Lobe Enucleation, Step by Step, for a Beginner Surgeon. Videourology. 2019: **33**
22. Bozzini G, Besana U, Calori A, Berti L, Buizza C. 7U-Thulium Laser Enucleation of the Prostate (7U-ThuLEP): description of the technique. Urology Video Journal. 2020: **7**:100036

Figures

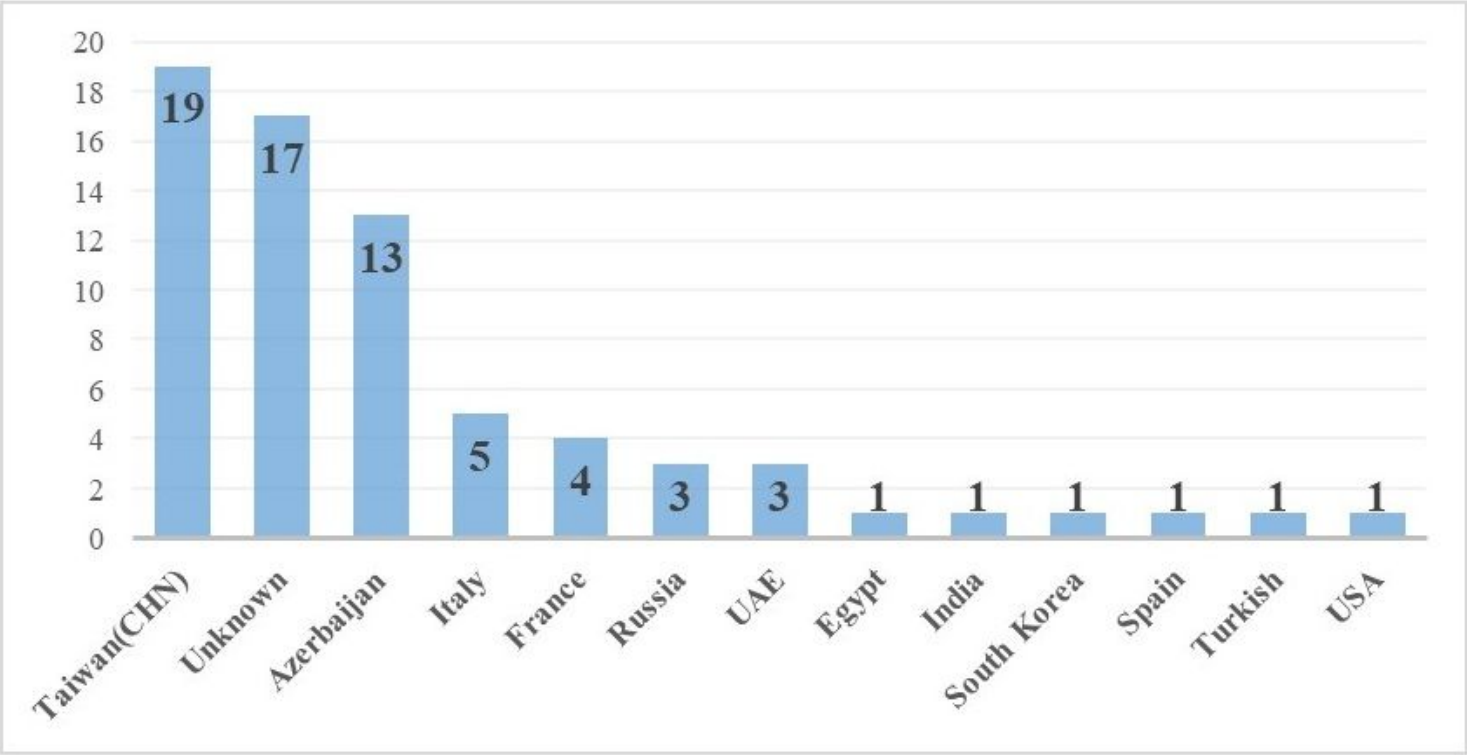

Figure 1

The countries' distribution of the authors

Supplementary Files

This is a list of supplementary files associated with this preprint. Click to download.

- Linksitesofvideos.docx