

# YouTube as a source of information on varicose veins

Tevfik Güneş<sup>1</sup>, Mustafa Serinken<sup>2</sup>, İhsan Alur<sup>1</sup>, Halil Beydilli<sup>3</sup>, Ozgur Karcioğlu<sup>4</sup> and Cenker Eken<sup>5</sup>

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## Abstract

**Background:** There has been little investigation of videos related to varicose veins in Internet media. This study aimed to investigate the characteristics and scientific accuracy of the videos related to varicose veins which were uploaded to the youtube.com website.

**Methods:** The YouTube site was searched in October 2014 using the keywords varicose vein, varicose veins, and varicosis with no filter. The contents of the reviewed videos were assigned to three groups as useful, partly useful, and not useful by using the criteria including the scientific contents of the videos, contemporariness and accuracy of the insight, and presentation of the data particularly regarding the visual features. The statistical analysis was based only on the videos rated as 'useful.'

**Results:** In total, 1519 (84.4%) of 1800 videos evaluated were excluded. Many of the sources uploading videos to the website were healthcare professionals (32.7%  $n = 92$ ). Regarding the source of the upload, those from official institutions/associations were viewed statistically significantly more often than videos uploaded by all others ( $p = 0.001$ ). The rated usefulness was significantly higher for videos uploaded by official institutions/associations (100%) than those uploaded by others ( $p = 0.01$ ).

**Conclusions:** Official institutions/associations should be encouraged to produce and upload videos including up-to-date and comprehensive information regarding the disease. Likewise, additional search tools would be useful to locate videos uploaded by academic figures and institutions.

## Keywords

Varicose veins, varicosis, usefulness, youtube, Internet

## Introduction

Up to one-fifth of the population has been documented to have varicose veins in different studies, although the incidence increases in the elderly. Varicose veins involving the superficial venous system of the lower limb are prevalent in both developed and developing countries.<sup>1</sup> Elderly females carry the highest risk, although no age or gender subgroup is immune from the disease. A sedentary lifestyle, pregnancy, family history, and geographic influences are known to be major risk factors. Conservative management (compression and medication), external laser, injection sclerotherapy, endovenous interventions (endovenous laser and radio-frequency ablation), and open surgery are considered the options for treatment.<sup>2,3</sup> The disease and its treatment costs impose a substantial cost and workforce loss for the community.<sup>4</sup>

Internet use has increased rapidly throughout the world, especially the developed world, in recent years,

and in some communities, almost all inhabitants are web users. People use the Internet to search for information as-needed at almost any time in their daily lives. YouTube is a free video sharing website that has been in operation since 2005. Some one billion individuals

<sup>1</sup>Department of Cardiovascular Surgery, Faculty of Medicine, Pamukkale University, Denizli, Turkey

<sup>2</sup>Department of Emergency Medicine, Faculty of Medicine, Pamukkale University, Denizli, Turkey

<sup>3</sup>Department of Emergency Medicine, Faculty of Medicine, Mugla Sıtkı Koçman University, Mugla, Turkey

<sup>4</sup>Department of Emergency Medicine, Faculty of Medicine, Acibadem University, Istanbul, Turkey

<sup>5</sup>Department of Emergency Medicine, Faculty of Medicine, Akdeniz University, Antalya, Turkey

## Corresponding author:

Tevfik Güneş, Department of Cardiovascular Surgery, Faculty of Medicine, Pamukkale University, Kınıklı, Denizli 20070, Turkey

Email: tevfik04@yahoo.com

view its content monthly. It is user-friendly and available to view frequently at no cost to a broad population. Furthermore, as smart phones have become more common, the YouTube website is used by greater numbers of people and more often.<sup>5</sup>

There are few data in the literature investigating videos related to varicose veins in internet media. Results of these studies are encouraging.<sup>6,7</sup> The present study focuses on the characteristics and scientific accuracy of the videos uploaded and available on the YouTube website related to varicose veins.

## Materials and methods

The YouTube website was searched in October 2014 using the keywords varicose vein, varicose veins, and varicosis, with no filters. We screened the most recent 600 videos (20/page, 30 pages) yielded when each of the three keywords/phrases were searched. Thus 1800 videos were harvested and evaluated for this study. The following were used as exclusion criteria:

- Duplicate videos
- Non-English-language videos
- Irrelevant content
- Alternative medicine
- Advertisements
- Humorous videos

In total, 1800 videos were evaluated regarding the exclusion criteria, yielding 281 eligible ones. The characteristics, content, number of views, identity of uploaders, durations, and inclusion of animations were recorded and evaluated. Each video was then viewed by two independent researchers (vascular surgeons) with special regard to its usefulness to the public. In cases of discrepancies between the interpretations of the two researchers, a third independent expert was asked to evaluate the video and this was accepted as the final decision.

The contents of the reviewed videos were assigned to three groups as useful, partly useful, and not useful by using the criteria including the scientific contents of the videos (general information about the disease, diagnosis and treatment), contemporariness and accuracy of the insight and presentation of the data particularly regarding the visual features. A useful video was defined as meeting all the criteria. A deficiency in one or more criteria was defined as partly useful or not useful. The statistical analysis was based only on the videos rated as 'useful.'

## Statistical analysis

All data obtained in the study were recorded in and analyzed using the SPSS software (ver. 17 for

**Table 1.** Reasons for excluding videos from the analysis.

	<i>n</i> (%)
Duplicate videos	803 (52.9)
Non-English	156 (10.3)
Irrelevant	152 (10.0)
Alternative medicine	128 (8.4)
Advertisement	259 (17.1)
Funny/recreational videos	21 (1.4)
Total	1519 (100.0)

Windows). The variables were investigated using the Kolmogorov–Smirnov and Shapiro–Wilk tests to determine whether the data were normally distributed. Numerical variables are given as medians and interquartile ranges (IQRs), while categorical variables are given as frequencies (*n*) and percentages (%). The group comparisons for numerical variables were performed with Kruskal–Wallis and  $\chi^2$  tests for categorical variables. Post hoc analyses were performed with the Mann–Whitney U-test with Bonferroni correction. Interrater agreement was calculated using the  $\kappa$  test. All hypotheses were constructed as two-tailed and an alpha critical value of 0.05 was considered to indicate statistical significance.

## Results

In total, 1519 (84.4%) of 1800 videos evaluated were excluded. More than half of these were duplicates (52.9%) and all causes are listed in Table 1.

Table 2 lists the characteristics of the 281 videos eligible for this study. Many of the sources who uploaded the videos to the website were healthcare professionals (32.7%, *n* = 92). Most of the videos concerned treatment of the disease (61.9%, *n* = 174). These videos commonly included information related to treatment modalities, such as endovenous laser ablation (EVLA), endovenous radiofrequency ablation (RFA), and external laser (59.7%, *n* = 104; Table 2). No information related to complications due to the procedures was found in the videos.

With regard to the source of the upload, official institutions/associations were viewed statistically significantly more than videos uploaded by all others (*p* = 0.001). Other groups did not differ significantly from each other. Rate of usefulness was also significantly higher for videos uploaded by official institutions/associations (100%), compared with those uploaded by other bodies (*p* = 0.01; Table 3).

Videos rated as useful were viewed significantly more frequently than the others (*p* = 0.02; Table 3). No significant relationship was identified regarding the upload

**Table 2.** Characteristics of the videos included in the analysis.

	<i>n</i>	% <sup>a</sup>
Date (year) uploaded		
2011 and earlier	89	31.7
2012	61	21.7
2013	65	23.1
2014 (first 10 months)	66	23.5
Individual or institution uploaded the item		
Healthcare professional(s) (physician, nurse)	92	32.7
Hospital	74	26.3
Television show	46	16.4
Lay people	30	10.7
Internet website	25	8.9
Governmental/official institution/associations	14	5.0
Provides general information on the disease		
Yes	151	53.7
Provides information on diagnosis		
Yes	48	17.1
Provides information on treatment		
Yes	174	61.9
Treatment modality explained in the script		
EVLA, RFA, external laser	104	59.7
Sclerotherapy	79	45.4
Compression	29	16.6
Open surgery (stripping, ligation)	43	24.7
Medical treatment	6	3.4
Was animation used in the video?		
Yes	43	15.3
Total	281	100.0

EVLA: endovenous laser ablation, RFA: radiofrequency ablation.

<sup>a</sup>The percentages were calculated within the group (*n* = 174) providing information on the treatment.

dates of the videos (*p* = 0.616). The weighted  $\kappa$  value was 0.864 (95% CI = 0.739 – 0.912) between the two observers.

## Discussion

In the present study, we investigated the characteristics of the videos uploaded to the YouTube website related to varicose veins, most of which (59%) were found to have been uploaded by a healthcare professional or a hospital. However, the videos uploaded by a healthcare professional or a hospital did not have higher rates of viewing or usefulness.

This study showed that rate of usefulness and viewing scores were significantly higher for videos uploaded by official institution/associations when compared with others.

Yaylaci et al. investigated YouTube videos with regard to cardiopulmonary resuscitation and pointed out that videos produced and uploaded by official institutions/associations attracted higher interest and the information included was more up-to-date and accurate.<sup>8</sup> Production of didactic videos by official institutions/associations for the community and uploading them to web sites viewed commonly may contribute to public education on the issue.

Most of the YouTube videos analyzed in the present study focused on the treatment of varicose veins. In this study, 281 videos meeting the study criteria related to varicose veins were analyzed, excluding those concerning alternative medicine, which were abundant on the website.

Ching et al. showed that many websites publishing information on the treatment of varicose veins in the internet media concerned mostly herbal therapeutic options.<sup>9</sup> They also reported that the videos providing the most comprehensive information were mostly those from hospital sources. In the present study, videos from hospitals ranked third following those from official institutions/associations and TV programs with regard to utility.

Most videos related to the treatment of varicose veins on the YouTube website concerned contemporary techniques, such as EVLA, RFA, and external laser. These treatment options were launched and gained widespread availability since the 2000s because they are less invasive than the ‘conventional’ methods of stripping and ligation. These new modalities have low complication rates, their outcomes are comparable to conventional techniques, and they are performed without any skin incision. They are associated with faster healing and less pain, and thus are preferred by both patients and surgeons over the older methods.<sup>10</sup>

Modern treatment methods of the varicose veins frequently described in the evaluated videos have provided a very wide range of treatment options for patients. Many can be performed in outpatient clinics.<sup>11</sup> Scurr et al. conducted a study on web sites publishing information on the treatment of varicose veins in England, and reported that EVLA, RFA, external laser, and the conventional techniques were the most commonly mentioned modalities in these Internet media. The authors also indicated that these web sites did not include any information on the complications that may possibly be encountered following these treatments.<sup>12</sup> This finding is consistent with our results, suggesting there is generally insufficient information on treatment outcomes in internet media.

**Table 3.** Distribution of scores of the videos and download rates with respect to source of upload.

Individual or institution uploaded the item	Mean number of views per video (n)	Number of views median (IQR)	Rates of usefulness (%)
Lay people	9581	893 (205–10,911)	40.0
Healthcare professional(s)	12,165	950 (366–4608)	57.6
Hospital	13,652	1570 (316–8560)	71.6
Television show	16,022	1653 (279–10,554)	89.1
Internet website	26,789	3098 (457–27,574)	44.0
Governmental/official institution/associations	101,139	9315 (1903–72,024)	100.0
		<i>p</i> value = 0.001*	<i>p</i> value = 0.01**

IQR: interquartile range.

\*The post hoc analysis revealed that “governmental/official institution/associations” were significantly different from others.

\*\*The post hoc analysis revealed that governmental/official institution/associations and TV programs were significantly different from others.

The content of YouTube videos is determined by the preferences of the uploader; there is no restriction or selection in the process. Thus, the scientific and educational value and usefulness of the videos are uncontrolled. With widespread availability and the ease of publication of videos, YouTube can be a useful tool for propagating valuable healthcare information. However, the absence of any peer-review process means there is no way to avoid the spread of inaccurate and even hazardous material with no concrete scientific basis.<sup>5</sup> It may be helpful to add a symbol or a warning to the video links on the YouTube website indicating usefulness and scientific accuracy. Similarly, an advanced search tool could be embedded within the website to enable searching only for items uploaded by academic figures and institutions.

### Limitations

The content in internet media is ever-changing with respect to time and date of a search. This study was conducted via a search of the YouTube website using keywords determined a priority (varicose vein, varicose veins, and varicosis) and included only items in the first 30 pages (20 videos/page). Additionally, videos were assigned to three groups as useful, partly useful, and not useful, instead of using a validated scoring system.

### Conclusions

The findings of this study support that YouTube videos related to varicose veins are not very useful. A promising result is that videos rated as ‘useful’ had been viewed considerably more frequently than the others. Official institutions and/or public associations should be encouraged to produce and upload videos containing comprehensive information regarding the disease as

well as up-to-date treatment options, including potential risks, complications, or adverse events. Finally, additional search tools would be useful to enable searching for videos uploaded by a government, official institutions, or academic figures.

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