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Research Article

Are YouTube™ Videos Useful for Patients? An Evaluation of YouTube™ Videos on Zygomatic Implants

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Abstract

Aim: The aim of this study was to evaluate the quality of information provided by YouTube™ videos on zygomatic implants.
Material and Method: YouTube™ videos were searched using the keyword "Zygomatic implants". The first 200 videos were analyzed. After exclusion, the remaining 94 videos were independently analyzed by two investigators for demographic characteristics and content usefulness. All videos were rated as poor, fair, or excellent based on a usefulness score that assessed the quality and flow of the content. Overall video ratings included duration, views, likes, dislikes, and comments. Video content was analyzed using an 8-point scoring list. All videos were categorized according to their source. Categorical data were analyzed using Pearson's chi-squared test. For non-normally distributed data, the Kruskal-Wallis test was used for between-group comparisons, and post-hoc Dunn's test was used for multiple comparisons. The significance level was set at $p<0.050$.
Results: Analysis of the video upload locations showed that the highest rate was from the USA (51.1%), followed by India (21.3%) and Spain (5.3%). Regarding the source of the uploaded videos, 11.7% were educational videos produced by doctors, 54.2% were patient information videos, and 34% were promotional videos. There was a statistically significant difference in the median number of views, likes, and dislikes depending on the source of the video upload ($p<0.001$), but no statistically significant difference was found in other video parameters.
Conclusion: Healthcare professionals should evaluate YouTube™ videos on zygomatic implants for clinical accuracy and content quality, and recommend videos to patients that meet professional standards and achieve the intended educational goals.

Keywords: E-healthcare, social media, zygomatic implants

INTRODUCTION

Certain patients with significant upper jaw bone deterioration (advanced bone resorption and/or large maxillary sinuses) are not eligible for conventional dental implant treatment in the edentulous maxilla. This is due to a lack of sufficient bone density to support the implants. Bone grafting has become a standard practice in oral rehabilitation for the past three decades and can be performed either as a separate procedure or in conjunction with implant placement (1,3). While bone grafting may address the lack of suitable bone for implants, it introduces another challenge—the donor site. This results in more invasive surgery, a longer procedure, and a higher overall cost (4-6). In search of ways to bypass bone grafting, the dental field has embraced zygomatic implants. Over the last twenty years, this technology has emerged as a successful treatment for severely atrophied upper jaws and even for jawbone removal surgery. Additionally, various techniques and implant designs have been developed, such as curved and/or short implants, implants anchored through the pterygomaxillary suture, and transnasal implants in cases of advanced bone resorption (7,8).

Designed to restore full functionality in patients with significant upper jawbone loss, zygomatic implants offer a solution for those with large defects caused by tumor removal, injuries, or congenital abnormalities (9,10). The zygomatic arch is used to anchor a long implant that can be combined with conventional implants to support

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dentures, prostheses, and/or obturators. For patients with significant maxillary defects, zygomatic implants provide a pathway to complete oral rehabilitation. This technique restores lost function, enhances facial aesthetics, and allows many patients to resume a fulfilling social life.

The explosion of internet accessibility across the globe has fueled a surge in people turning to online resources for information on healthcare (11,12). The rise of social media has further accelerated the growth of user-generated content, transforming the way information spreads. People of all ages and backgrounds can now share information instantly across the globe, bypassing traditional barriers of time and location (13). One of these social media platforms, ranking as the second most visited website in the world, is YouTube™ (14). With over 2 billion daily views, YouTube™ boasts a vibrant community where new videos are uploaded every minute, and users remain engaged for an average of 15 minutes daily (15). Social media platforms also provide information that allows people to cross-reference information provided by clinicians, bringing together new, additional, or conflicting material (16). However, these sites have minimal guidelines for the content of uploaded material and operate on the principle of freedom of expression. The ability to create health information extends beyond medical professionals; anyone with internet access can contribute and share health-related content on these platforms, which may lead to the dissemination of false information (17). A review of the literature showed that videos uploaded to YouTube™ about maxillofacial surgery have been evaluated. However, although many videos about zygomatic implants exist from various sources, these videos have not been evaluated. This research investigated the quality, accuracy, and content of the most popular YouTube™ videos on zygomatic implants. The goal was to determine if these videos serve as a trustworthy and informative resource for viewers.

To the best of our knowledge, no study has analyzed the usefulness and effectiveness of YouTube™ videos on zygomatic implants. The aim of this study is to evaluate the information flow and quality of YouTube™ videos on zygomatic implants and to inform health professionals who may produce content on this topic in the future.

MATERIAL AND METHOD

Study Design and Sample

This study adopted a cross-sectional approach to address the research objective. The target population for this analysis comprised all YouTube™ videos that provided information on zygomatic implants between 9 AM and 6 PM on August 22, 2022. The following search term was used: "zygomatic implants." The "Sort by relevance" filter was used as the default for YouTube™ searches. A sample of the first 150 videos retrieved from YouTube™ using this search query was subsequently analyzed for content. The videos were initially screened to restrict the sample to English-language videos only, excluding duplicate videos, videos without audio or titles, and unrelated videos. Only videos in English, with acceptable sound and image quality, and with primary content about zygomatic implants were included in this study (Figure 1). When the inclusion and exclusion criteria were applied, 94 videos were deemed eligible for the study.

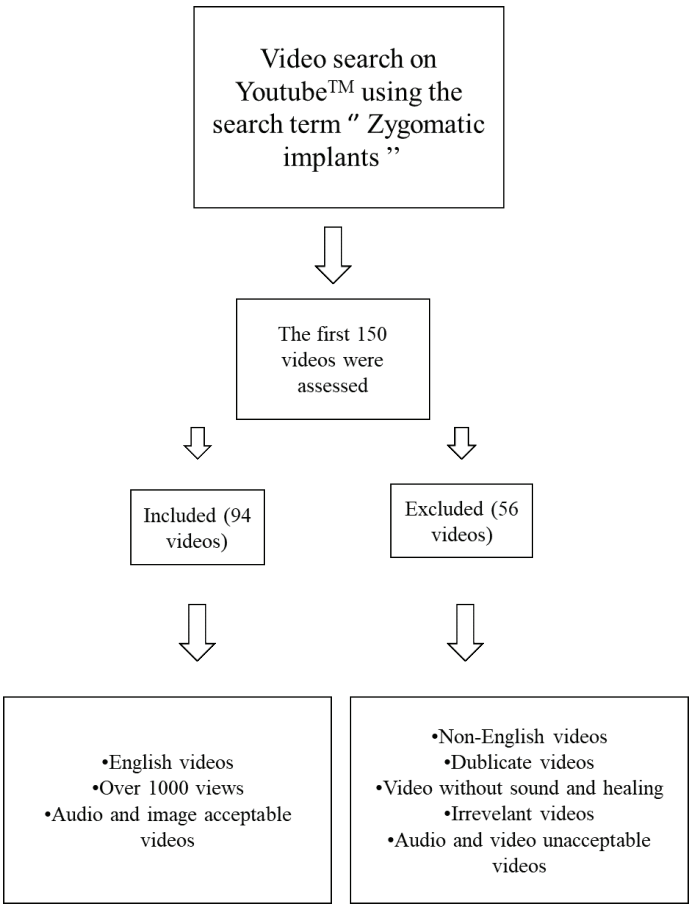

Figure 1. YouTube video selection for analysis

Variables

Each video was analyzed for various engagement metrics, including view count, total length, comments, likes, dislikes, upload date, and country of origin. Additionally, viewer interaction was assessed through two key metrics: interaction index (calculated as the percentage difference between likes and dislikes divided by total views) and view rate (calculated as the daily view count since upload).

All videos were grouped into three categories according to the type of person uploading the video. These categories were identified as educational videos made by healthcare professionals for doctors, informational videos for patients, and promotional videos.

The videos were assessed for their coverage of key topics related to zygomatic implants. This included definitions, candidate suitability (indications), reasons for unsuitability (contraindications), potential advantages (benefits), any additional procedures that might be involved (related procedures), possible risks and complications, associated costs, and long-term outcomes (prognosis and survival). A summary of these categories is shown in Table 1.

Table 1. Scored video content topics	
Scoring item	Score points
Definition	1
Indications	1
Contraindications	1
Advantages	1
Procedures involved	1
Complications	1
Cost	1
Prognosis and survival	1
Total score	8

Two investigators watched and analyzed the videos independently. Inter-rater blinding was used to ensure that the raters evaluated the videos independently. The two researchers, both oral and maxillofacial surgeons with up-to-date knowledge of zygomatic implants, rated the videos. To avoid potential bias, the raters evaluated the videos without prior knowledge of view counts, likes, dislikes, or comments.

Each video was evaluated across eight key content areas (Table 2) and assigned a score from 0 to 8 points. Videos receiving scores from 0 to 2 were categorized as having poor content quality and deemed unsuitable for patients. Scores of 3 to 5 indicated fair content that delivered a useful message but lacked in-depth coverage on certain aspects. Finally, videos scoring 6 to 8 points were deemed excellent, providing patients with comprehensive and accurate information (18).

Table 2. Video usefullness scoring	
Score	Definition
Poor (0-2 points)	Poor quality and poor flow of video, some information is listed but most is missing, not at all useful for patients
Moderate (3-5 points)	Moderate quality and suboptimal flow of video, some important topics are discussed but others are poorly mentioned, somewhat useful for patients
Excellent (6-8 points)	Excellent quality and flow of video, excellent and accurate information is mentioned, very useful for patients

Statistical Analysis

Statistical analysis was performed using IBM SPSS V23 software. Data normality was assessed using the Shapiro-Wilk test. Categorical data were analyzed using the Pearson chi-squared test. For non-normally distributed data, the Kruskal-Wallis test was employed for intergroup comparisons, with post-hoc Dunn's test for multiple comparisons. Spearman's rank correlation coefficient was utilized to evaluate relationships between non-normally distributed variables. Inter-rater reliability for video categorization and scoring was assessed using the intraclass correlation coefficient (ICC). Results are presented as frequencies (percentages) for categorical variables and mean±standard deviation (SD) and median (minimum-maximum) for quantitative variables. The significance level was set at $p<0.050$.

RESULTS

When analyzing the upload locations of the videos, the highest rate was in the USA at 51.1%, followed by India at 21.3%, and Spain at 5.3%. Regarding the source of the uploaded videos, 11.7% were educational videos made by doctors, 54.2% were informative videos for patients, and 34% were promotional videos (Table 3).

Table 3. Distribution of upload source of videos and countries where they were uploaded		
Countries where videos are uploaded	Frequency	Percentage
Usa	48	51.1
Australia	3	3.2
Brazil	1	1.1
Costa Rica	1	1.1
India	20	21.3
England	4	4.3
Spain	5	5.3
Switzerland	3	3.2
Italy	2	2.1
Canada	3	3.2
Mexico	3	3.2
Romania	1	1.1
Video source		
Educational videos made by doctors	11	11.7
Informative videos for patients	51	54.3
Promotional videos	32	34

Our analysis revealed a statistically significant difference in the median view count based on the video upload source ($p<0.001$). The median view count for educational videos uploaded by doctors was 13,957, for informative videos for patients was 2,412, and for promotional videos was 639. Additionally, there was a statistically significant difference in the median number of likes based on the video upload source, suggesting that the uploader's identity may influence viewer engagement, as evidenced by the variation in both views and likes across different uploaders ($p<0.001$). The median number of likes for educational videos uploaded by doctors was 143, for informational videos for patients was 23, and for promotional videos was 8. The number of likes for promotional videos differed significantly from the others.

The analysis also revealed a statistically significant variation in the median number of dislikes depending on the upload source ($p<0.001$). The median value for educational videos shot by doctors was 6, while it was 0 for both informational videos for patients and promotional videos. The number of dislikes for promotional videos differed from the others. A statistically significant

difference was found between the median values of the number of views per time elapsed since upload according to the video upload source (p<0.001). The median value for educational videos uploaded by doctors was 9.48, for informational videos for patients was 2.59, and for promotional videos was 0.99. The number of views per time elapsed since uploading differed for all uploaders. Other parameters did not show a statistically significant difference according to the source of the video upload (p>0.050) (Table 4).

Table 4. Comparison of video parameters according to video upload source

	Video source				
	Educational videos made by doctors (n=11)	Informative videos for patients (n=51)	Promotional videos (n=32)	Test statistic	p*
Number of views	17391.73±6366.54 13957 (10925-28339)[c]	3026±1950.78 2412 (955-8108)[b]	699.25±211.72 639 (499-1563)[a]	72.244	**<0.001**
Duration	437.36±425.31 361 (66-1386)	823.16±1315.15 299 (43-6168)	1592.97±2806.5 254.5 (36-13907)	0.539	0.764
Comment	7.45±12.34 2 (0-41)	5.78±12.36 1 (0-71)	2.09±3.5 1 (0-14)	2.669	0.263
Like	158.09±155.57 143 (0-492)[a]	38.37±58.7 23 (0-395)[a]	11±10.63 8 (0-56)[b]	19.962	**<0.001**
Dislike	5.09±4.99 6 (0-16)[a]	1.37±1.89 0 (0-7)[a]	0±0 0 (0-0)[b]	25.923	**<0.001**
Time elapsed	2270.64±1969.22 1534 (271-5352)	1223.76±1031.23 1001 (63-5284)	1122.75±1070.08 786.5 (99-4186)	3.316	0.191
Interaction index	0.85±0.86 0.81 (0-2.76)	1.19±1.08 1.04 (0-6.05)	1.6±1.55 1.29 (0-8.25)	3.861	0.145
Viewing rate	20.29±20.38 9.48 (2.16-51.6)[c]	4.91±8.43 2.59 (0.35-58.68)[b]	1.65±1.76 0.99 (0.16-6.48)[a]	27.807	**<0.001**

*Kruskal-Wallis test; mean±standard deviation; median (minimum - maximum); a-c No difference between groups with same letter

A statistically significant difference was found between the medians of the number of comments according to the countries where the videos were uploaded (p=0.021). The median number of comments for videos uploaded from the USA was 1, from India was 5, and from other countries was 1. The number of comments for videos uploaded from India differs from the number of comments in the USA and other countries. Additionally, a statistically significant difference was found between the median values of Like-Dislike/Total Views according to the countries where the videos were uploaded (p=0.033). The median for the USA was 1.21, for India was 1.24, and for other countries was 0.84. The Like-Dislike/Total Views ratio of videos uploaded from India and other countries differs. Other parameters did not show statistically significant differences according to the countries where the videos were uploaded (p>0.050) (Table 5).

Table 5. Comparison of video parameters by country of upload

	Video source				
	USA (n=48)	India (n=20)	Others (n=26)	Test statistic	p*
Number of views	3112.17±3563.91 1469 (511-13957)	1979.65±1820.57 1372 (499-6429)	6885.92±8878.69 2889 (513-28339)	2.786	**0.248**
Duration	998.73±1473.46 281.5 (39-5876)	1178.1±1885.05 355 (100-6168)	1010.23±2672.79 308.5 (36-13907)	1.52	0.468
Comment	2.63±4.06 1 (0-17)[a]	11.45±18.04 5 (0-71)[b]	3.42±8.44 1 (0-41)[a]	7.756	0.021
Like	28.92±37.97 16.5 (0-199)	49.6±87.75 24.5 (3-395)	64.15±120.22 12 (0-492)	0.637	**0.727**
Dislike	0.79±1.69 0 (0-8)	1.3±1.98 0 (0-6)	2.38±3.94 0 (0-16)	3.467	**0.177**
Time elapsed	1422.58±1433.05 990 (99-5352)	976.95±623.13 815 (63-2250)	1365.15±1136.56 1016.5 (140-4025)	0.524	0.770
Interaction index	1.23±0.93 1.21 (0-4.45)[ab]	1.98±1.99 1.24 (0.41-8.25)[b]	0.87±0.76 0.84 (0-2.76)[a]	6.839	0.033
Viewing rate	4.15±7.14 2.37 (0.17-47.56)	5.94±12.9 1.47 (0.24-58.68)	8.02±13.98 2.79 (0.16-51.6)	1.084	**0.582**

*Kruskal-Wallis test; mean ± standard deviation; median (minimum - maximum); a-b No difference between groups with same letter

A statistically excellent agreement was found between the usefulness scores of the observers (ICC=0.990; p<0.001). The median value of the usefulness score according to the source of the video upload did not show a statistically significant difference (p=0.851) (Figure 2).

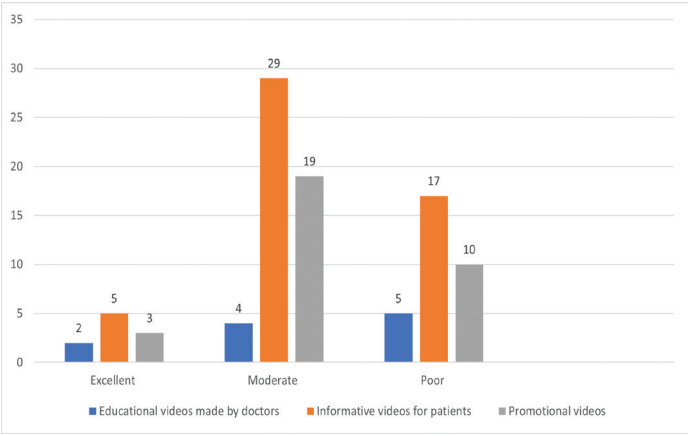

Figure 2. Source of upload of videos according to usefulness score

A statistically significant difference (p=0.007) was found between the median values of duration (seconds) according to the usability score categories. The median duration was 898 seconds in the excellent category, 333.5 seconds in the average category, and 204 seconds in the poor category, indicating that the durations of videos in the excellent category differed from those in the poor category. Additionally, a statistically significant difference was found between the median values of likes according to the usefulness score categories (p=0.039). The median number of likes was 33.5 in the excellent category, 12 in the average category, and 18 in the poor category, suggesting that the number of likes in the excellent category differed from those in the average category. A statistically significant difference was also found between the median values of dislikes according to the usefulness score categories (p=0.019). The median number of dislikes was 2 in the excellent category and 0 in both the average and poor categories, indicating that the number of dislikes in the excellent category differed from those in the average category (Table 6).

Table 6. Comparison of video parameters according to usefulness score categories

	Usefulness score categories				
	Excellent (n=10)	**Moderate (n=52)**	**Poor (n=32)**	**Test statistic**	**p***
Number of views	4620.5±5504.93 2242 (553-17582)	3353.06±5286.04 1245.5 (511-28339)	4607.72±6302.87 1701.5 (499-25857)	2.251	0.324
Duration	3286.7±4354.04 898 (114-13907)[b]	925.88±1370.76 333.5 (39-5876)[ab]	523.56±851.97 204 (36-3895)[a]	10.01	**0.007**
Comment	8.4±13.66 1(0-41)	4.77±10.67 1 (0-71)	3.5±8.48 1 (0-47)	0.335	0.846
Like	96.2±146.7 33.5 (2-492)[b]	31.65±64.27 12 (0-395)[a]	45±71.37 18 (0-327)[ab]	6.497	**0.039**
Dislike	2.9±3.25 2 (0-8)[b]	0.9±2.56 0 (0-16)[a]	1.56±2.37 0 (0-8)[ab]	7.975	**0.019**
Time elapsed	1149±879.88 811 (140-3291)	1363.81±1356.17 828.5 (99-5352)	1278.41±1105.58 1058 (63-4186)	0.054	0.973
Interaction index	1.77±0.92 1.72 (0.36-3.15)	1.33±1.49 1.02 (0-8.25)	1.07±0.81 0.96 (0-3.68)	4.338	0.114
Viewing rate	6.14±8.71 2.99 (0.17-29.9)	3.26±3.31 2.14 (0.16-13.6)	9.24±16.8 2.79 (0.23-58.68)	1.012	0.603

*Kruskal-Wallis test; mean ± standard deviation; median (minimum - maximum); a-b No difference between groups with same letter

A statistically significant positive but weak relationship was found between the usefulness score and the duration of the videos (r=0.337; p=0.001). There was no statistically significant relationship between any of the other parameters and the usefulness score.

The distributions of the usefulness score categories according to the source of the video upload did not show a statistically significant difference (p=0.735). Similarly, the distributions of the usefulness score categories according to the country where the video was uploaded did not show a statistically significant difference (p=0.618).

DISCUSSION

In the era of digital healthcare information seeking, patients increasingly utilize online resources to understand their medical conditions and explore treatment possibilities. This study aimed to evaluate the quality of information regarding zygomatic implants on YouTube™, a prominent open-access video-sharing platform with a continuously growing repository of healthcare-related content (19). Prior research within the domains of dentistry and oral and maxillofacial surgery has investigated the quality of information available online for various procedures, including wisdom tooth extraction, orthognathic surgery, dental implant placement, botox applications, and head and neck cancer treatment (20,21,23).

A consistent trend has emerged within the literature, with numerous studies evaluating the quality of online information for various healthcare procedures across dentistry (e.g., wisdom tooth extraction, orthognathic

surgery, dental implants), oral and maxillofacial surgery, orthopedics, neurology, and rheumatology. The overwhelming conclusion from this body of research suggests that these online resources are generally of low quality (22,24). Wong et al. proposed that YouTube™ videos on botulinum toxin injections for wrinkles may deviate from the norm, exhibiting high-quality content and potentially serving as a valuable resource for patients (25). Furthering the debate on the quality of online healthcare information, Gaş et al. suggested that YouTube™ videos on botulinum toxin applications for bruxism treatment can yield positive patient outcomes, arguing that such videos have the potential to provide scientifically accurate information on this specific use of Botox injections (18).

Although there are studies in the literature suggesting that YouTube™ videos can have positive informational outcomes, our study echoes the findings of many other studies and shows that the quality of videos commonly viewed on YouTube™ about zygomatic implants is generally questionable.

Highlighting the need for intervention, Hassona et al. emphasized the responsibility of healthcare professionals, academic institutions, and professional organizations to contribute to a more informative YouTube™ landscape. They advocate for the creation and upload of high-quality videos on oral cancer to address the current shortcomings in online resources (26). The escalating popularity of social media platforms like YouTube™ has paradoxically revealed a concerning deficit in the availability of trustworthy healthcare information. This coincides with a growing trend of patients seeking health knowledge through these platforms, placing a potential burden on professional organizations to enhance the quality and credibility of online health resources.

Some researchers have proposed the development of interfaces that can synergistically integrate YouTube™ content with evidence-based references, thereby promoting the dissemination of accurate health information (27). Further research suggests that video presentations may enhance patient information retention, potentially impacting future informed consent practices (28). Considering the existing body of literature alongside the findings of our study, it is evident that health-related YouTube™ videos warrant a degree of quality control.

Looking at the source of the videos, 11.7% were educational videos made by doctors, 54.3% were informational videos for patients made by doctors, and 34% were promotional videos. A few videos included patient comments, but these were classified as promotional videos because they were clearly clinic advertisements. The absence of independent videos from patients or their relatives suggests that the subject matter primarily concerns older patients, who are less likely to upload videos to YouTube™. The significantly different number of views, likes, and dislikes for educational videos filmed by doctors compared to other groups may be due to this topic being more interesting to medical professionals.

The average duration of doctors' educational videos was longer than that of other sources, but this difference was not statistically significant. Examining the usefulness scores, the average score for educational videos made by doctors was 3.09, for informational videos made by doctors was 3.14, and for promotional videos was 3.28. Based on these scores, it may not be accurate to compare the videos in terms of content, as the focus of each video type may differ. For example, educational videos made by doctors primarily focused on the procedure, whereas informational videos for patients focused more on indications, and promotional videos emphasized benefits.

It is important to acknowledge that this study has some limitations. Firstly, the results may be influenced by the specific keywords employed during the search process on YouTube™. Someone without sufficient knowledge of the subject may obtain different results by using different search terms. Secondly, videos on YouTube™ can be uploaded or deleted at any time, impacting the stability of the video dataset. Thirdly, the selection of videos presented in a YouTube™ search can be influenced by personalization algorithms that consider a user's search history and browsing habits, stored as cookies and cached data on their device. Due to the influence of these personalization algorithms, YouTube™ search queries can yield unique results for individual users. While the popularity of zygomatic implant procedures extends beyond English-speaking countries and into regions with non-English primary languages, this study was limited to evaluating English-language videos directly uploaded to YouTube™. This restriction limits the generalizability of our findings to a specific linguistic audience.

CONCLUSION

It is clear that social media platforms offer many conveniences, but care and caution should be exercised when sharing and receiving health-related information on these platforms. As demonstrated in our study, videos related to zygomatic implants on YouTube™ are not sufficiently reliable, high-quality, or comprehensive in content. Video producers should thoroughly define the topic, mention the indications and contraindications, describe the procedure, and objectively discuss the advantages and complications. Additionally, informing viewers about the cost and prognosis will increase the quality and reliability of the videos. Health-related topics should not be addressed without the assistance of health professionals, as incorrect procedures can lead to irreversible consequences.

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