Evaluating YouTube Videos for Resident Education in Free Flap Surgery

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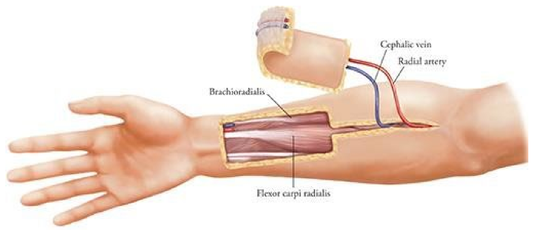
Background

The ease of access of online videos and the popularity of visual learning have made YouTube a highly-trafficked educational resource. However, because YouTube does not heavily regulate the accuracy of available content, there is concern for the quality of accessed information among resident trainees. A recent meta-analysis of YouTube video quality for graduate medical training demonstrated inadequacy of videos.

Given that that free flap surgery is technically difficult and requires extensive study prior to assisting in or attempting a free flap reconstruction in the operating room, we attempt to analyze the utility of YouTube videos as a means of graduate and professional medical education using tools validated by previous studies.



Radial forearm free flap (Morita et al., 2018)

Objectives

- **Primary objective:** Qualitative assessment of YouTube videos as a means of graduate and professional medical education.
- **Secondary objectives:**
  - Qualitative assessment of YouTube videos as a means of patient education.
  - Comparison of YouTube-accredited channel videos and expert-verified videos with those found with a routine, standard YouTube search

Methods

Video Selection:

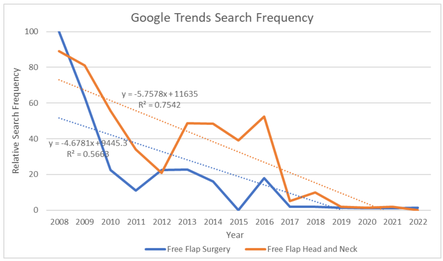
- "Free flap head and neck," and "Free flap surgery" were used as terms in standard YouTube searches
- The top 50 video results from each search were reviewed for inclusion
  - Inclusion criteria: English language videos.
  - Exclusion criteria: videos not in English, videos without voice overture, videos duplicates, videos not related to free flap procedures in head and neck surgery
- Relative search interest of these terms on YouTube from 2008-2022 was assessed via Google Trends.

Video Metrics and Categorization

- Collected metrics included date published, views, likes, dislikes, number of comments and duration. This data was used to calculate view ratio, like ratio, and video power index.
- Videos were categorized according to type, publisher, intended audience, flap type, and YouTube-accredited healthcare providers
- Videos were analyzed by free flap surgeons using Modified DISCERN, Global Quality Score, and JAMA Benchmark metrics of video quality, educational value, and transparency, respectively.

Statistical Analysis

- Statistical analysis of video metadata and expert-determined scores was performed to determine reviewer agreement and significance of relationships



Modified DISCERN Criteria	Possible Score
Are the aims clear and achieved?	1 to 5
Are reliable sources of information used? (Publication cited, speaker is an otolaryngologist)	1 to 5
Is the information presented balanced and unbiased?	1 to 5
Are additional sources of information listed for viewer reference?	1 to 5
Are areas of uncertainty mentioned?	1 to 5
MAXIMUM POSSIBLE SCORE	25

Global Quality Score	Score
Poor quality, poor flow of video, most information missing, not at all useful for patients/learners	1/5
Generally poor quality and poor flow, some information listed but many important topics missing, of very limited use to patients/learners	2/5
Moderate quality, suboptimal flow, come important information is adequately discussed but others poorly discussed, somewhat useful for patients/learners	3/5
Good quality and generally good flow, most of the relevant information is listed but some topics not covered, useful for patients/learners	4/5
Excellent quality and excellent flow, very useful for patients/learners	5/5

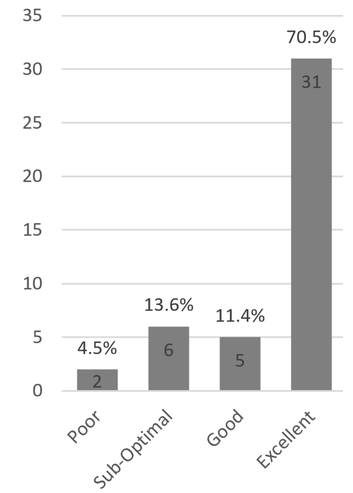
Results

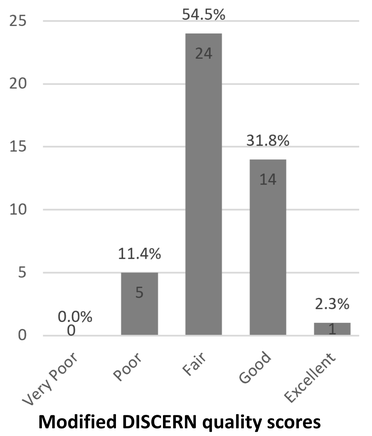
- Forty-four videos with 517,227 combined views were analyzed
- Video Characteristics:
  - Most videos were intra-operative (63.6%), produced by physicians (34.1%) or medical institutions (22.7%), and had target audiences of health professionals (95.5%)
  - A small proportion of videos came from creators verified by YouTube (22.7%) or other sources (15.9%).
- Statistical analysis:
  - Operative videos had statistically better popularity based on Video Power Index ($p < 0.01$).
  - Higher Modified DISCERN scores were significantly associated with independent educators ($p = 0.01$), webinars ($p < 0.01$), and health professional target audiences ($p = 0.04$).
  - Higher Global Quality Scores were also significantly associated with a health professional target audience ($p < 0.01$) and videos without YouTube verification ($p = 0.03$).
  - High JAMA scores significantly associated with independent educators ($p < 0.01$), journal publishers ($p < 0.01$), videos validated by YouTube ($p = 0.04$).

Summary of Video Characteristics and Expert Scoring

Characteristics	Mean (95% CI)
Video Power Index *(m.d.* = 5)*	7.11 (4.47, 9.76)
Modified DISCERN Criteria	15.41 (14.76, 16.06)
Global Quality Score - Patients	2.09 (1.96, 2.22)
Global Quality Score - Residents	4.17 (3.90, 4.44)
JAMA Benchmark	2.71 (2.31, 3.10)

**m.d. = missing data*





Conclusions

- Routine YouTube searches may not yield results ideal for resident education in head and neck free flap surgery.
- Many videos were of good or excellent educational value (GQS), though transparency scores (JAMA) and reliability scores (Modified DISCERN) were lower than would be ideal for education.
- Vetted educational or healthcare sources should be strongly considered as options for resident surgical education, especially in highly technical and demanding operations such as free flaps.

Acknowledgements

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References

- Osman W, Mohamed F, Elhassan M, Shoufan A. Is YouTube a reliable source of health-related information? A systematic review. BMC Med Educ. 2022;22(1):382.
- Madathil KC, Rivera-Rodriguez AJ, Greenstein JS, Gramopadhye AK. Healthcare information on YouTube: A systematic review. Health Informatics J. 2015;21(3):173-94
- Helming AG, Adler DS, Keltner C, Igelman AD, Woodworth GE. The Content Quality of YouTube Videos for Professional Medical Education: A Systematic Review. Acad Med. 2021 Oct 1;96(10):1484-1493.