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Research Communication

The safety of surgical mesh: what is online video content teaching our patients?

Patients are increasingly anxious about the use of mesh in surgery [1]. Due to the complications associated with transvaginal mesh for pelvic organ prolapse repair, many patients are understandably reluctant to consent to other procedures that also involve mesh, such as those for stress urinary incontinence and hernia repair, despite evidence-based practice supporting its use in surgery [1,2]. As clinicians, it is essential we provide education with reference to appropriate sources of information and recognize that patients may have informed or misinformed preconceptions in this area.

The Internet is the one of the most readily accessible sources for patients to access health information. In the United States in 2013, 72% of people with access to the Internet had used it to search for health information [3]. Currently in 2021, there is an even greater dependence on the Internet as a medium for accessing information. After Google, YouTube is the second most popular website in the world. YouTube is a website with the world's largest, free-to-access online video content. In recent years, particularly with the impact of the COVID-19 pandemic, it has had a growing influence on the distribution of health information [4]. The concern is that, as a source of information for patients, the videos available on this platform providing health information are not regulated, potentially perpetuating a misunderstanding of many health conditions.

Our objective was to assess the quality and content of information which patients are likely to view when searching online video content regarding the safety of mesh in surgery.
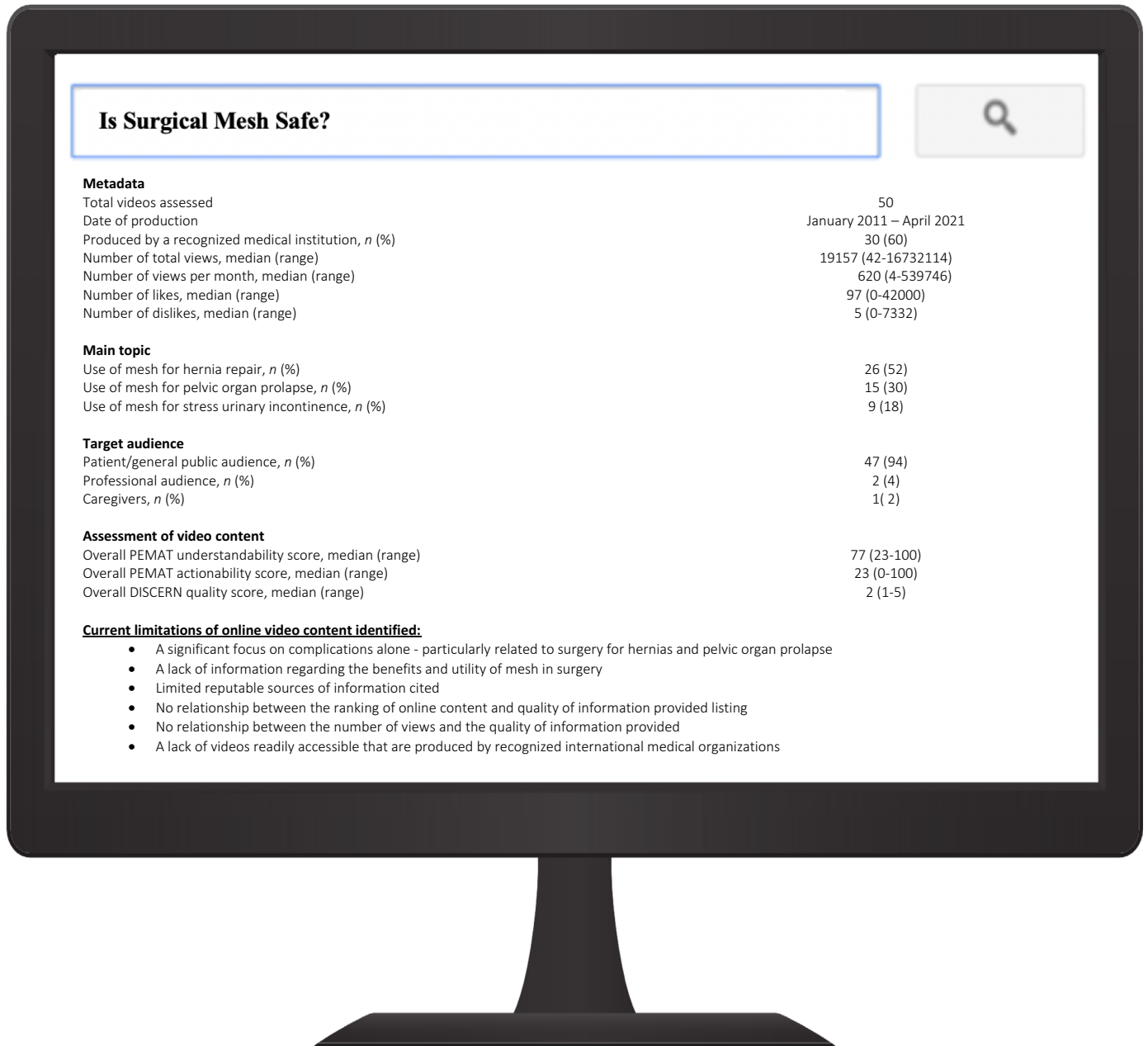
Two independent reviewers searched '*Is surgical mesh safe?*' on YouTube in June 2021 and evaluated the first 50 videos listed, reflecting the content patients are most likely to view. No search or geographic restrictions were applied, including language. Subtitles were used to interpret videos ($n = 3$) in languages other than English. No videos were excluded. Information related to views, video producer, quality of content, understandability and actionability for viewers was assessed. The videos were assessed using the validated Patient Education Materials Assessment Tool (PEMAT) and the DISCERN criteria [5,6]. PEMAT is a tool which assesses the understandability and actionability of audio-visual content [5]. It consists of assessment of 13 areas of understandability and four areas of actionability. For each area, assessors graded the content on whether or not it reflected the criteria, as either 'Agree', 'Disagree' or 'Not Applicable'. 'Agree' was chosen if the content assessed occurred in 80–100% of the material presented. The total score was then calculated ('Agree' = 1 point, 'Disagree' = 0 points) and a percentage score for understandability and actionability generated. The DISCERN criteria assess the quality of consumer health information, focusing on the sourcing, bias and reliability of information provided [6]. The content is assessed across 16 areas, rated overall from a score of 1 (serious or extensive shortcomings) to 5 (minimal bias). Before assessing content, both reviewers familiarized themselves with the PEMAT and DISCERN tools. Any conflicts in the grading of material were discussed between reviewers and a decision made. Statistical analysis was performed using R software version 3.6.3 (R Foundation, Vienna, Austria). Univariate analysis was performed using a Mann–Whitney *U*-test to assess correlation of PEMAT and DISCERN scores with the characteristics of video content such as numbered listing on the internet and content produced by validated medical institutions. A *P* value of <0.05 was taken to indicate statistical significance.

The first 50 videos listed by YouTube when searching '*Is surgical mesh safe?*' were produced from January 2011 to April 2021. Their characteristics are outlined in Fig. 1. It was found that 60% of the videos were produced by a recognized medical institution. A total of 22% of video content had advertising material referring viewers to medical or legal services in case they had experienced complications from surgical mesh. The median (range) number of total views per video was 19157 (42–16732114) and the median (range) number of views per month was 620 (1–539746). Viewers overall seemed engaged with the content presented, with a median of 97 likes compared to a median of 5 dislikes per video. Viewer engagement was encouraged across the content, with 76% of videos allowing viewers to write comments and questions, to which video producers often responded.

Despite the median PEMAT understandability score of the content being 77% (range 23–100%), there was limited actionability of content, reflected by a PEMAT score of 23% (range 0–100%). The DISCERN criteria reflect the quality and relevance of information provided to viewers. The overall quality of information provided was poor and failed to adequately address the safety of surgical mesh, reflected by a median (range) relevance score of 1 (1–4), a median (range) bias assessment score of 2 (1–5) and a median (range) overall score of 2 (1–4). There were significant shortcomings in referenced material and evidence-based information provided to patients.

Fig. 1 Summary of online video content addressing the question, 'Is Surgical Mesh Safe?'. PEMAT, Patient Materials Assessment Tool.

Is Surgical Mesh Safe?

Metadata

Total videos assessed	50
Date of production	January 2011 – April 2021
Produced by a recognized medical institution, *n* (%)	30 (60)
Number of total views, median (range)	19157 (42-16732114)
Number of views per month, median (range)	620 (4-539746)
Number of likes, median (range)	97 (0-42000)
Number of dislikes, median (range)	5 (0-7332)

Main topic

Use of mesh for hernia repair, *n* (%)	26 (52)
Use of mesh for pelvic organ prolapse, *n* (%)	15 (30)
Use of mesh for stress urinary incontinence, *n* (%)	9 (18)

Target audience

Patient/general public audience, *n* (%)	47 (94)
Professional audience, *n* (%)	2 (4)
Caregivers, *n* (%)	1(2)

Assessment of video content

Overall PEMAT understandability score, median (range)	77 (23-100)
Overall PEMAT actionability score, median (range)	23 (0-100)
Overall DISCERN quality score, median (range)	2 (1-5)

Current limitations of online video content identified:

- A significant focus on complications alone - particularly related to surgery for hernias and pelvic organ prolapse
- A lack of information regarding the benefits and utility of mesh in surgery
- Limited reputable sources of information cited
- No relationship between the ranking of online content and quality of information provided listing
- No relationship between the number of views and the quality of information provided
- A lack of videos readily accessible that are produced by recognized international medical organizations

Concerningly, only 6% of video content addressed the safety and efficacy of surgical mesh in stress urinary incontinence and hernia repair, with the majority of content focusing instead on complications related to mesh in abdominal surgery and for pelvic organ prolapse. There was particular emphasis on mesh erosion and the development of chronic pain syndrome. Further, on univariate analysis, there was no association for video content produced by a medical institution with a higher overall PEMAT or DISCERN score ($P = 0.859$). Nor was there an association of the numbered listing ($P = 0.893$) or number of views ($P = 0.993$) with higher PEMAT or DISCERN scores.

Online video content is one of the most readily accessible, cost-effective and popular media for patients to search health conditions [7]. This is one of the first studies to assess the quality of information disseminated by online videos relating to the use of mesh in surgery. Overall, online videos have been shown to be a poor source of information for patients to gain an understanding of the safety, utility and efficacy of surgical mesh. Whilst video content was well presented, the quality of information was significantly biased, with limited citations of sources of information reported and limited discussion addressing the current use of mesh in surgery. There was an overwhelming focus on individuals' own

complications associated with transvaginal mesh, which has the potential to obscure patients' opinions on the use of mesh in other forms of surgery. Concerningly, there was no association between the quality or validity of information with the number of views of video content or the order in which content was listed on the search engine results page. Similar results have been reported in other topical areas in medicine pertaining to online videos as a source of health information [7]. While there is no doubt that audio-visual content can be effective in conveying information to patients, the lack of regulation of content is a significant limitation of this platform. The most influential factor in increasing video content accessibility online remains the number of total views [8].

Clinicians need to be aware of these limitations, as patients may have viewed online videos prior to a consultation and therefore may have already formed preconceptions of the use of mesh (Fig. 1). Clinicians need to explore and address the concerns of patients and ensure that they are educated with appropriately sourced information, which can include appropriately selected online content. Clinicians should keep in mind that the most appropriate online video content may not be the top listed video on the search engine results page [7]. Further, specifically for patients considering surgery, surgeons should consider multiple consultations so that patients can come to an appropriate informed decision before proceeding.

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Abbreviation: PEMAT, Patient Materials Assessment Tool.