Does YouTube provide high-quality resources for patient education on atrial fibrillation ablation?

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ABSTRACT

Objective: Catheter ablation has a role in the treatment of selected patients with atrial fibrillation (AF). Patients are increasingly utilising the internet as an education resource. However, there is limited oversight on online patient information. This study aimed to determine the quality of video-based patient education resources for catheter ablation in AF.

Methods: YouTube was searched for "Ablation" and one of "Atrial Fibrillation" or "AFib" or "AF" (a total of three searches). Videos were included if they discussed catheter ablation and excluded if they primarily discussed surgical/hybrid ablation or were non-English language. Each video was scored by two authors for compliance with a gold-standard item set created from patient booklets from the Arrhythmia Alliance.

Results: A total of 6357 videos were identified from all searches. Of these, a total of 111 videos met inclusion criteria and were included in the analysis. The median number of views for each video was 1794.5 (IQR 335 to 10,972) with a median duration of 217 s (IQR 135 to 444 s). The median number of essential criteria found in each video was 4/21 (IQR 3 to 6), and no video met all the essential criteria. Video score was not significantly correlated with video likes or number of views.

Conclusions: No available videos provide sufficiently detailed information for a patient to have a reasonable understanding of catheter ablation. A lack of correlation between views/'likes' and video score suggests patients are unable to critically evaluate these resources for educational content.

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1. Introduction

Atrial fibrillation (AF) represents a major healthcare burden [1], and the European prevalence is expected to double between 2010 and 2060 [2]. Catheter ablation has been shown to improve arrhythmia-free survival and is increasingly used as a major treatment modality in both paroxysmal and persistent AF [3–6]. Recent evidence supports an improvement in mortality with atrial ablation in those with left ventricular dysfunction [7]. Despite improvements in ablation techniques, adverse events remain important considerations when considering ablation as a treatment modality [8–11].

There is increasing expectation that patients are fully involved in treatment decisions in cardiology [12]. For this to be effective, patients require sufficient information to make informed decisions. However, for complex procedures with variable outcomes and significant risks,

the opportunity to provide sufficient information in a single clinical encounter is severely limited [13]. As a result, additional information is often provided to patients, for example in the form of leaflets produced by recognised specialist organisations. Whilst these are very valuable resources, often well written and carefully scrutinised by experts in the field [14,15], some patients will still turn to the internet to look for information about a procedure that has been suggested to them [16]. It has long been recognised that these resources are of varying quality [17], and some organisations attempt to provide patients with validated sources of information [18].

The internet provides a significant potential venue for patient resources [19]. The potential for video-based resource used by both patients and professionals is well recognised [20–22]. YouTube (www.youtube.com) is the largest repository of video material on line with over one billion users [23]. However, there are limited controls or safeguards available to ensure the material available is correct or accurate. Indeed, it has previously been shown that many videos demonstrate incorrect or poorly structured information [20]. To date, no one has explored the availability and suitability of videos discussing catheter ablation for AF as a patient centred resource.

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This study aimed to systematically locate and assess videos on YouTube from which patients may expect to obtain information regarding AF catheter ablation. Further, the study aimed to assess whether patients were able to correctly recognise videos which contain appropriate and complete information.

2. Methods

2.1. Search strategy

YouTube was searched on 11th September 2016 for "Ablation + AF", "Ablation + AFib", and "Ablation + Atrial Fibrillation". The searches were undertaken by two different authors (E.R. and A.J.X.) using a Google Chrome browser. The cache of each computer and search history of the browser were reset before each search to reduce any impact on search results. In addition, each author was not signed into their Google account.

The search was limited to the first 20 pages as it was felt to be unlikely that patients would search further than this. This limitation is in line with work by previous groups [24,25]. Videos were included if they appeared to provide patient-focused information regarding AF catheter ablation. Videos were excluded if they focused on 'hybrid' or open-heart ablation techniques, they were of a purely technical nature and focused on detailed ablation technique, they were unrelated to AF ablation, or there were non-English language videos. Videos that discussed ablation of arrhythmias more broadly were included if they specifically had details regarding AF catheter ablation.

Following the initial search, the titles and descriptions of videos from each of the three searches were examined. Those felt to be suitable were then fully viewed to confirm that they fulfilled inclusion criteria. The initial search, subsequent screening, analysis, and scoring of videos were performed independently by two of the authors (E.R. and A.J.X.). Any discrepancies were solved by consensus, if consensus could not be reached a third author was the tie-break (C.F.C.). The channels of those uploading videos felt suitable for analysis were also searched for appropriate content.

2.2. Development of a gold standard

A 'gold standard' for sufficient and appropriate patient information was developed. A minimum criteria set were taken from a patient leaflet by the Arrhythmia Alliance/AF Association on AF catheter ablation [26]. Where necessary, additional detail was provided by the senior author (K.R.) to create a set of essential and ideal criteria (Supplementary Table 1). Essential criteria were deemed to be the minimum information points required by a patient to make an informed decision regarding consent to an ablation procedure. Additional points related to further information which it was felt a reasonable and experienced clinician in this field would consider communicating to a patient during a discussion of catheter ablation for AF.

2.3. Data acquisition

YouTube provides additional information on published videos. This 'metadata' was catalogued for each selected video on 21st June 2017. The metrics included in this analysis were hits (number of video views), likes and dislikes (cumulative user based votes that are assigned to videos), duration of the video, and date the video was uploaded onto YouTube.

Any set of videos uploaded as separate files that appeared to contain the same video content was classified as a repeat. Repeats were treated as a single file for analysis; all hits, like and dislikes were summed. Any videos which appeared to be part of a series were considered as a single file; all hits, likes, and dislikes were averaged between files in a series.

2.4. Video scoring

Included videos were scored separately by two authors (E.R. and A.J.X.). Any discrepancies were solved by consensus, if consensus could not be reached a third author was the tie-break (C.F.C.). Videos were additionally grouped based on the broad category of content: patient experience, patient-focused education, health care practitioner education, advertisements, intra-operative videos. Division into different groups was a subjective decision based on criteria outlined in Supplementary Table 2.

2.5. Statistical methods

Continuous variables were expressed as mean ± SD or median (interquartile range [IQR]) and compared across groups using the independent Student t-test or Mann-Whitney U test, respectively. Categorical variables were reported as frequency (percentage) and compared between groups using the χ^2 test. To assess the ability of users to determine appropriate videos, association between video meta-data and a sum of essential criteria was assessed using Spearman's rank correlation coefficient due to the ordinal nature of video scores. A p-value < 0.05 was considered significant. SAS software, Version 9.3 of the SAS system for Windows (Copyright 2002–2010 by SAS Institute Inc., Cary, NC, USA) was used for all statistical analysis.

3. Results

3.1. Videos on YouTube

There were a total of 6357 video results from the three searches undertaken of YouTube (Atrial Fibrillation, 3780; AFib, 1730; AF, 847). Of these a total of 1200 videos were reviewed (all videos on the first 20 pages of results) and 110 met inclusion criteria and were included in the analysis (Fig. 1). Single videos made up 105 (95.5%) of those entries included in the analysis, the remaining five entries were series of videos (range 2–8 videos). As shown in Fig. 2, the majority of entries included in this analysis were located when using either "Atrial Fibrillation" (77, 70%) or "AFib" (71, 64.5%).

Of the videos included, the median number of views for each video was 1794.5 (IQR 335 to 10,972) with a median duration of 217 s (IQR 135 to 444 s). As displayed in Table 1, the majority of videos were categorised as either patient education (58, 52.7%) or advertisements (32, 29.1%).

3.2. Quality of videos on YouTube

None of the videos reviewed met all of the essential criteria. The median number of essential criteria found in each video was 4 (IQR 3 to 6) of a potential maximum of 21. There was no significant difference in scores between video categories. AF as a condition was sufficiently explained in 52 videos (47%) and 60 videos (54%) provided information regarding the role of catheter ablation in isolating abnormal electrical activity. Sixty-two videos (56%) provided no description of procedural risks with death and stroke discussed in only 12 (11%) and 14 (13%) videos respectively. Success rates were provided in 32 videos (28%); in these videos success rates ranged from 30 to 95%. The potential for failure was discussed in 26 videos (24%). A full list of essential criteria and the number of videos compliant with these criteria is listed in Table 2.

3.3. Meta-data prediction of quality

To assess if patients/viewers are correctly viewing and determining views of high quality, the number of hits and likes obtained by each video were compared against the video's total score. The video total score showed non-significant weak positive correlation with video hits ($R^2 = 0.144$, $n = 110$, $p = 0.13$) and video likes ($R^2 = 0.167$, $n = 106$, $p = 0.086$). However, length of time the video had been on YouTube moderately correlated with video hits ($R^2 = 0.571$, $n = 110$, $p < 0.0001$) and likes ($R^2 = 0.348$, $n = 106$, $p = 0.0003$). Video duration was moderately correlated with total video score ($R2 = 0.584$, $n = 110$, $p < 0.0001$).

4. Discussion

The results of this analysis demonstrate that no videos found on YouTube at the time of this systematic search provide patients with sufficient information. In particular, over half of videos missed critical information discussing AF as a condition. Although relatively uncommon, death is an important complication to discuss with patients and was mentioned by only approximately 10% of videos. Incomplete discussion of complications has been found by others assessing online sources of patient information [24]. Kwok et al., noted that the majority of videos discussing varicose vein treatment options did not provide a balanced discussion [27].

An unbalanced discussion of benefits and risks is not limited to video-based patient information online. [28] An objective discussion of the risks and benefits should be expected when a patient is discussing treatment options with a clinician, since a lack of thorough discussion of complications may bias patients towards active treatment options. Direct-to-consumer (DTC) advertising of pharmaceutical products is