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# Assessing the Information Quality, Accuracy and Content of YouTube Videos on the Endo-Perio Lesions: A Cross-Sectional Study

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**ABSTRACT**

**Aim:** The aim of this study is to evaluate and analyse the quality, accuracy and content of videos about endo-perio lesions on the Youtube platform.

**Material and Methods:** The search term "endo-perio lesions" was identified using the Google Trends application. On 1 December 2023, between 10:00 and 13:00, the term "endo-perio lesions" was searched on YouTube videos. The URLs of the first 200 videos were copied and the 40 videos that met the inclusion criteria were evaluated and scored for Global Quality Score (GQS), Modified DISCERN (mDISCERN) scale and completeness. Statistical analysis was conducted using descriptive statistics, as well as the Shapiro-Wilk and Mann-Whitney U tests. The significance level was determined as $p<0.05$.

**Results:** The highest average GQS (mean±SD: 4,40 ± 0,52), mDISCERN (mean±SD: 4,80 ± 0,42) and completeness score (mean±SD: 4,90 ± 1,45), were found in videos posted by dentists or specialists. Among the content of the 40 videos, the most frequently mentioned topic was 'treatment of endo-perio lesions' (%82.5), followed by 'clinical and radiographic findings' (%77.5), 'etiological factors' (%62.5) and 'diagnosis' (%62.5). Other topics included, in decreasing order, 'classification of endodontic lesions' (%55), 'prognosis (%50)', 'microbiology' (%10) and 'pathology' (%10).

**Conclusion:** It can be concluded that YouTube can provide valuable and useful information about endodontic lesions, within the limitations of this study. However, it is recommended to supplement this information with additional details on the prognosis, microbiology, and pathology of the lesions.

## Endo-Perio Lezyonlar Konusundaki YouTube Videolarının Bilgi Kalitesinin, Doğruluğunun ve İçeriğinin Değerlendirilmesi: Kesitsel Bir Çalışma

**Makale Bilgisi**

**Makale Geçmişi**

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**Anahtar Kelimeler:**
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Sosyal medya,
YouTube.

**ÖZET**

**Amaç:** Bu çalışmanın amacı YouTube platformunda endo-perio lezyonlarla ilgili videoların kalitesini, doğruluğunu ve içeriğini değerlendirmek ve analiz etmektir.

**Gereç ve Yöntemler:** Google Trends uygulaması ile arama terimi olarak "endo perio lesions" belirlendi ve 1 Aralık 2023 günü saat 10:00 ile 13:00 arasında YouTube videolarında "endo-perio lezyonlar" terimi arandı. İlk 200 videonun URL'leri kopyalanmış ve dahil edilme kriterlerini karşılayan 40 video Global Kalite Puanı (GQS), Modifiye DISCERN (mDISCERN) ölçeği ve video içerik bütünlüğü açısından değerlendirilerek puanlandı. İstatistiksel analiz, tanımlayıcı istatistiklerin yanı sıra Shapiro-Wilk ve Mann-Whitney U testleri kullanılarak yapıldı. Anlamlılık düzeyi $p<0,05$ olarak belirlendi.

**Bulgular:** En yüksek ortalama GQS (ortalama±SS: 4,40 ± 0,52), mDISCERN (ortalama±SS: 4,80 ± 0,42) ve video içerik bütünlüğü puanı (ortalama±SS: 4,90 ± 1,45) diş hekimleri veya uzmanlar tarafından yayınlanan videolarda bulundu. 40 videonun içeriğinde en sık bahsedilen konu 'endo-perio lezyonların tedavisi' (%82,5) olurken, bunu 'klinik ve radyografik bulgular' (%77,5), 'etiyolojik faktörler' (%62,5), ve 'tanı' (%62,5) takip etti. Diğer konular azalan sırayla 'endodontik lezyonların sınıflandırılması' (%55), 'prognoz' (%50), 'mikrobiyoloji' (%10) ve 'patoloji'yi (%10) içeriyordu.

**Sonuç:** Bu çalışmanın sınırları dahilinde YouTube'un endodontik lezyonlar hakkında değerli ve faydalı bilgiler sağlayabileceği sonucuna varılabilir. Ancak bu bilgilerin lezyonların prognozu, mikrobiyolojisi ve patolojisine ilişkin ek ayrıntılarla desteklenmesi önerilir.

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## INTRODUCTION

The periodontium is connected to the pulp by various anatomical structures, such as the dentinal tubules, the apical foramen and the lateral and accessory canals. This relationship can lead to the spread of infection, resulting in typical symptoms of endodontic-periodontal bone lesions. Pulpal and periodontal issues can interact and cause tooth loss in over 50% of cases. Therefore, managing the treatment of endo-perio lesions is crucial for preserving the tooth and achieving a positive prognosis.[1]

Although several classifications[2-6] have been proposed for endo-perio lesions, the most widely used one is the classification developed by Simon et al.[7] This classification comprises five subcategories: Primary Endodontic Lesions, Primary Endodontic Lesions with Secondary Periodontal Involvement, and Primary Periodontal Lesions. Primary Periodontal Lesion with Secondary Endodontic Involvement. “True” Combined Lesions.

Primary endodontic and periodontal lesions are generally easy to diagnose and treat clinically. The pulp remains vital in primary periodontal disease. However, in primary endodontic disease, the pulp is infected and non-vital and does not respond to vitality tests. Diagnosing endo-perio lesions can be challenging for dentists due to the clinical and radiographic similarities between secondary periodontal relationship and primary endodontic disease, secondary endodontic relationship and primary periodontal disease, or combined diseases.[8,9] However, there is a lack of current documentation providing information regarding current treatment protocols for endo-perio lesions.

Search engines on the internet allow people to quickly access to curious topics. YouTube is easily accessible and provides cost-free information to users. Since its official launch in The rapid increase in smartphone usage in November 2005 enabled YouTube videos to reach more users. Every day, 65,000 new videos are uploaded and 100 million videos are watched.[10]

YouTube has recently been the subject of academic studies due to its popular content production and impact on the masses. As patients and professionals frequently refer to YouTube for health-related issues, the accuracy and quality of the information on the platform is of utmost importance. Previous studies have analysed the quality, content and accuracy of dentistry videos on YouTube, covering topics such as dental implants, broken instruments, orthodontics and wisdom tooth surgery.[11-14]

According to the our researches, there is currently no study in the literature that evaluates the quality, content and accuracy of YouTube videos on endo-perio lesions. The aim of this study was to analyse the quality, content and accuracy of such videos on endo-perio lesions.

## MATERIALS AND METHODS

Google Trends is a service that provides statistical information on word or sentence queries searched in Google, including their frequency, language, and geographic location. In this study, we consulted the search terms 'endo perio lesions', 'perio endo lesions', and 'Combined periodontic-endodontic lesions' using the Google Trends application. We found that 'endo perio lesions' is the most frequently searched term on the subject. On 1st December 2023, between 10:00 and 13:00, a search was conducted on YouTube (www.youtube.com) for videos related to endo-perio combined lesions in endodontics using the search term 'endo perio lesions'. YouTube search results were sorted by relevance, which is the default.

This study included the first 200 videos encountered. Two observers, each with at least 7 years of clinical experience in endodontics, further evaluated these videos. 160 videos,

which not contain visual and audio content, were not in English, were longer than 30 minutes, were duplicates, or were unrelated to the topic were excluded from evaluation (Table 1). The remaining 40 videos that met the inclusion criteria were analyzed by the two observers. All video links have been included as search results may vary over time after applying exclusion criteria. This study did not require approval from the local ethics committee as the survey data is publicly available on YouTube.

**Table 1.** Reasons for exlusion

| Reasons | Value |
|---|---|
| Not in English | 10 |
| No audio | 6 |
| Duplicated | 4 |
| Longer than 30 minutes | 10 |
| Irrelevant | 130 |
| Total excluded | 160 |

A literature review was conducted to assess the accuracy and currency of the videos. The investigators scored each video based on its information content regarding etiology, treatment, and prognosis on a scale of 0-2 (0 = incomplete, 2 = very complete), with a total score of 6. Another evaluation method used was the 5-point Global Quality Score (GQS) index. Videos were scored from 1 to 5 based on their quality, usefulness to patients, flow, educational value, and overall quality (Table 2). The reliability and accuracy of the information presented in the videos were evaluated using the 5-point mDISCERN scale, which was developed from the mDISCERN reliability tool. (Table 3).

**Table 2**. Global quality score

| Scores description |
|---|
| 1. Poor quality; Very unlikely to be of any use to patients |
| 2. Poor quality but some information present; Of very limited use to patients |
| 3. Suboptimal flow, some information covered but important topics missing; Somewhat useful to patients |
| 4. Good quality and flow, most important topics covered; Useful to patients |
| 5. Excellent quality and flow; Highly useful to patients |

**Table 3.** The Modified DISCERN score (1 point for every yes, 0 points for no)

| Item Questions |
|---|
| 1.Are the aims clear and achieved? |
| 2.Are reliable sources of information used? (i.e., publication cited, speaker is specialist in diabetes) |
| 3.Is the information presented both balanced and unbiased? |
| 4.Are additional sources of information listed for patient reference? |
| 5. Are areas of uncertainty mentioned? |

The videos covered the definition, causes, clinical and radiographic findings, diagnosis, classification, treatment, pathology, microbiology, and prognosis of endo-perio lesions. Each video was analysed to determine whether it covered these topics. Additional features such as video duration, upload date, likes, views, and source were also recorded. The study evaluated viewers' interactions by calculating the engagement index and view rate. The engagement index was calculated as the number of likes minus the number of dislikes divided by the total number of views, multiplied by 100%. The view rate was calculated as the number of views divided by the number of days since upload, multiplied by 100%. The videos were classified based on their source as Dentist / Specialist, Hospital / University, TV / YouTube channel, or commercial. In cases where there was disagreement among the researchers in the classification and scoring of the videos, a consensus was reached by conducting an unbiased and careful literature search.

**Statistical Analysis**

The SPSS 21.0 program was used to conduct the data analysis. Interobserver agreement was assessed through Fleiss Kappa analysis. The normal distribution of the data was checked using the Shapiro-Wilk test, and non-parametric tests were performed due to the parameters not being normally distributed. Pairwise comparison tests were conducted using the Mann Whitney U test. The confidence interval for the analysis was set at 95% with a significance level of 0.05 ($p<0.05$).

## RESULTS

Following the application of inclusion and exclusion criteria, 40 out of 200 videos were included in the study. Table 3 presents the distribution of reasons for exclusion. The first video was uploaded in 2013, with 13 videos uploaded between 2013 and 2019, and 27 videos uploaded between 2020 and 2023. Descriptive statistics of video shares are presented in Table 4. The average length of YouTube videos discussing endo-perio lesions was found to be 24.45 minutes. The videos had an average of 998,50 views (Min.: 7 / Max.: 18000) and a viewing rate of 94,36 (Min.: 8,05 / Max.: 1666.66). On average, viewers interacted with the videos by giving 12,00 likes (Min.: 0 / Max.: 408) and 0.15 comments (Min.: 0 / Max.: 20). The videos had been installed for an average of 1080.00 days (Min.: 21 / Max.: 3600) (Table 4). Comparison of the quantitative data of the videos by source category is presented in Table 5.

**Table 4.** Descriptive statistics of the YouTube videos about Endo-perio lesions search term

| Quantitative variable | Min | Max | Median | SD | IQR |
|---|---|---|---|---|---|
| **Views** | 7.00 | 18000.00 | 998.00 | 3489.56 | 2355 |
| **Likes** | 0.00 | 408.00 | 12.00 | 68.00 | 39 |
| **Comments** | 0.00 | 20.00 | 0.15 | 3.31 | 1.00 |
| **Duration** | 0.00 | 29.00 | 23.00 | 16.96 | 31.75 |
| **Days since upload** | 21.00 | 3600.00 | 1080.00 | 960.82 | 720 |
| **Interaction index** | 0.00 | 14.28 | 1.86 | 2.81 | 1.94 |
| **Viewing rate** | 8.05 | 1666.66 | 94.36 | 322.39 | 224.22 |

SD: Standard deviation; IQR: Interquartile range; Min; Minimum; Max: Maximum

**Table 5.** Comparison of quantitative data of YouTube videos about Endo-perio lesions according to loading source

| Quantitative variable | Dentist/Specialist (n=10) Median (Min; Max; IQR) | Hospital/University (n=6) Median (Min; Max; IQR) | Commercial (n=3) Median (Min; Max; IQR) | TV/Youtube (n=24) Median (Min; Max; IQR) | p value |
|---|---|---|---|---|---|
| **Views** | 551.00 (87; 18000; 2939)[a] | 653.5 (305; 8700; 7035)[a] | 250.00 (1500; 2600; 10)[a] | 100.00 (7; 11000; 1610)[a] | >0.05 |
| **Likes** | 23.50 (2; 408; 43)[a] | 14.50 (3; 76; 61)[a] | 22.00 (0; 45; 15)[a] | 10.00 (1; 133; 37)[a] | >0.05 |
| **Comments** | 0.50 (0; 20; 1)[a] | 0.00 (0; 1; 0)[a] | 1.00 (0; 2; 0)[a] | 0.00 (0; 5; 1)[a] | >0.05 |
| **Duration** | 15.50 (0; 29; 26.5)[a.b] | 20.00 (10; 26; 6.25)[a] | 29.67 (18; 29; 0) [b] | 25.00 (3; 29; 37.5)[a.b] | **<0.05** |
| **Days since upload** | 1080.00 (360; 2520; 308)[a] | 900.00 (360; 2880; 1710)[a] | 360.00 (360; 3600; 0)[a] | 720.00 (21; 3600; 720)[a] | >0.05 |
| **Interaction index** | 2.87 (1; 5.53; 2.67)[a] | 1.51 (0.75; 3.05; 2.08)[a.d.e] | 1.46 (0; 1.80; 0)[b.c.d] | 1.67 (0.15; 14.28; 2.09)[b.c.e] | **<0.05** |
| **Viewing rate** | 47.86 (8.05; 1666.66; 265.52)[a] | 165.00 (17.66; 805.55;369.37)[a] | 416.66 (72.22; 694.44; 0)[a] | 137.63 (14.02; 833.3; 170)[a] | >0.05 |

n: Number of videos; SD: Standard deviation; p: Significance level; IQR: Interquartile range; Min; Minimum; Max: Maximum, a-e: Different letter indicates statistical difference within the same line.

Based on the source of the uploaded videos, there were 10 (%25) videos in the Dentist/Specialist category, 6 (%15) in the Hospital/University category, 3 (%7.5) in the commercial category, and 21 (% 52.5) videos in the TV/YouTube channel category. The videos were ranked by number of views, with the Hospital/University category having the highest number of views, followed by the Dentist/Specialist category, the commercial category, and finally the TV/YouTube channel category (Table 5).

Based on the comparison test results from video sources, there was no statistical difference found between dentist/specialist and hospital/university sources in terms of quantitative variables (p>0.05) (refer to Table 5). However, the interaction index in the

dentist/specialist source (2,87) was significantly higher than that in the commercial source (1,46) (refer to Table 5). Table 5 shows that the interaction index in the dentist/expert source (2,87) was significantly higher than that in the TV/Youtube channel (1,67).

The completeness, Modified DISCERN and GQS scores are shown in Table 6. The weighted kappa value for inter-observer agreement was 0,84, 0,80, and 0,80 for completeness score, Modified DISCERN score, and GQS, respectively. No statistical difference was found in terms of completeness, Modified DISCERN score, and quality scores for the videos uploaded between dentist/specialist and hospital/university sources (p>0.05) (Table 6).

**Table 6.** Comparison of information completeness, accuracy and general quality scores according to the upload source of the videos

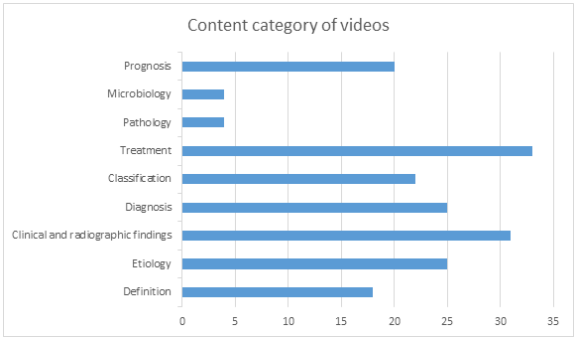
| Scores | Dentist/Specialist (n=10) Median (Min; Max; IQR) | Hospital/University(n=6) Median (Min; Max; IQR) | Commercial (n=3) Median (Min; Max; IQR) | TV/Youtube (n=24) Median (Min; Max; IQR) | p value |
|---|---|---|---|---|---|
| **Etiology** | 2,00 (1; 2; 1)[a] | 1,50 (0; 2; 1)[a,b] | 1,00 (0; 2; 0)[a,b] | 1,00 (0; 2; 1)[b] | **p<0,05** |
| **Treatment** | 2,00 (1; 2; 1)[a] | 1,00 (1; 2; 1)[a,b] | 2,00 (1; 2; 1)[a,b] | 1,00 (0; 2; 1)[b] | **p<0,05** |
| **Prognosis** | 2,00 (0; 2; 2)[a] | 1,00 (0; 2; 1)[a] | 2,00 (0;1; 1)[a] | 1,00 (0; 2; 1)[a] | p>0,05 |
| **Overall Score (0-6)** | 5,50 (2; 6; 2)[a] | 4,00 (2; 4; 3)[a,b] | 5,00 (1; 4; 1)[a,b] | 3,00 (0; 6; 2)[b] | **p<0,05** |
| **mDiscern (1-5)** | 5,00 (4; 5; 0)[a] | 4,00 (4; 5; 1)[a,d] | 3,00 (2; 3; 1)[c] | 4,00 (3; 5; 2)[b] | **p<0,05** |
| **GQS (1-5)** | 4,00 (4; 5; 1)[a] | 3,00 (2; 5; 2)[b,c] | 3,00 (2; 3; 1)[b,c] | 3,00 (2; 4; 2)[a,b,c] | **p<0,05** |

n: Number of videos; SD: Standard deviation; p: Significance level; IQR: Interquartile range; Min; Minimum; Max: Maximum, a-d: Different letter indicates statistical difference within the same line

A statistically significant difference was found in the modified discern and GQS scores between videos uploaded by dentists/specialists and those uploaded by commercial sources (p<0.05). Modified Discern and GQS scores for videos uploaded by dentists/specialists were significantly higher than scores for videos uploaded from commercial sources (Table 6). A statistical difference was detected in terms of etiology, treatment, total score, modified discern and GQS scores for the videos uploaded between dentist/specialist and TV/Youtube sources (p<0.05). Etiology, treatment, total score, Modified Discern and GQS scores for the videos uploaded by the dentist/specialist were significantly higher than the scores in the videos uploaded from TV/Youtube sources (Table 6).

The 40 videos covered various topics related to endo perio lesions. The most commonly mentioned topic was the treatment of such lesions (%82,5), followed by clinical and radiographic findings (%77,5), etiology (%62,5), and diagnosis (%62,5). The remaining topics, in decreasing order of frequency, were classification of endo perio lesions (%55), prognosis (%50), microbiology (%10), and pathology (%10) (Fig. 1).

**Figure 1.** Frequency distribution of videos by content category




## DISCUSSION

In today's digital world, the first sources used to research or get information about a subject are websites such as YouTube and Google. Websites have a significant role in our daily lives and have become increasingly important in various aspects. As well as showcasing patient experiences, YouTube also serves as a source of information for both patients and healthcare professionals. Videos

uploaded without scientific filtering may provide incorrect or incomplete information to patients and healthcare professionals.[15] Given the increasing use of the internet in healthcare, it is clear that the professionals should to do more to address this issue.

There are many studies in the literature that have been conducted using YouTube to analyse videos related to dentistry.[10-14,16,17] While some researchers reported that the content quality of YouTube videos on dental topics was adequate[16,17], some studies reported that the video content was inadequate.[14,18,19] Differences in the subject analysed, evaluation criteria and parameters used may have led to different results. To date, no other study has been found that analyses the quality, content and accuracy of videos about endodontic lesions on YouTube. The aim of this study was to assess the quality of information and content in videos on YouTube related to endo-perio lesions. YouTube offers various filter options, including 'video duration', 'upload date', and 'views'. For our study, we used the 'sort by relevance' filter, which has been found to be the most popular filter in previous research.[16-20]

The first video uploaded was in 2013, 13 videos were uploaded between 2013 and 2019, and 27 videos were uploaded between 2020 and 2023. The fact that the majority of videos were uploaded in the last 3 years may be due to the popularity of YouTube for sharing health content in recent years. Our study analysed a total of 40 videos that met the criteria. While some previous studies include a larger number of videos[16,18], others include a similar number of videos.[17,19] This study revealed that the interaction index of the dentist/expert upload source was significantly higher than that of commercial sources and TV/Youtube channel sources. However, it is important to note that the ranking of videos on YouTube can impact their interaction and viewing rates. Therefore, videos with accurate and comprehensive information may not always appear at the top, resulting in lower viewing rates.

Singh et al. (2012) developed the mDISCERN score to estimate the reliability and clarity of information in YouTube videos, which was used in this study.[21] The study employed the GQS to assess the quality of patient information, consistent with prior research.[17,19] In addition, the quality and accuracy of the information in the videos were determined using the completeness score, in line with previous studies.[13,14,17] The GQS and mDISCERN scores of the dentist/expert upload source were significantly higher than those of commercial sources and TV/Youtube channel sources. In addition, the GOS, mDISCERN and completeness scores of the dentist/expert source were found to be higher than all other sources, although not statistically significant. Consistent with previous studies[14,16,17], it is expected and acceptable that the quality, accuracy, and completeness scores of videos uploaded by dentists and professionals are higher than those from other sources.

The most commonly mentioned topic was the treatment of such lesions (%82.5), followed by clinical and radiographic findings (%77.5), etiology, and diagnosis (%62.5). The topics that were least frequently mentioned included prognosis (%50), microbiology (%10), and pathology of the lesions (%10). There is a lack of content on YouTube regarding the microbiology (%10) and pathology of endo-perio lesions (%10).

This study has limitations, particularly in the classification of videos according to their sources. For instance, some videos may belong to multiple categories such as dentist/specialist and TV/Youtube channels. One limitation of this study is that the results may vary depending on the chosen keywords. The search term used in this study was selected based on Google Trends application data. Furthermore, due to the dynamic nature of YouTube[16], the order of search results is subject to constant change as a result of viewer interaction over time.[22] It is important to note that the data collection

method used in this study was instantaneous, which is a limitation shared by similar studies. Another limitation of this study was that only English language videos were included in the study. Since there are many countries where English is not the native language, changing the target audience in cases where the search term is not written in English may have affected the results of the study.

A further limitation of the study is that the videos of endo-perio lesions were not evaluated by a periodontist, and video analysis was performed only by endodontists. Furthermore, the classification scoring of endo-perio lesions was not conducted in accordance with the most recent and updated classification.[23] Since it is more widely known and used, Simon et al.[7] it was made based on the endo-perio lesion classification made by. This constitutes an additional limitation of the study. There is a significant lack of information on YouTube regarding the new classification. It is therefore necessary to create informative expert-led videos on this subject.

Based on the limitations of this study, it can be concluded that YouTube may serve as a valuable source of information for endo-perio lesions. However, it is recommended to supplement this information with additional details on the prognosis, microbiology, and pathology of the lesions.

## CONCLUSION

The information quality and accuracy of videos uploaded to YouTube about endodontic lesions was generally considered sufficient. To improve the information available on YouTube about endo-perio lesions, it is recommended to eliminate gaps in knowledge regarding their prognosis, microbiology, and pathology. The quality and accuracy of videos about endo-perio lesions uploaded by dentists/experts is higher than other uploader sources. Dentists should be aware of dental information available on YouTube and other websites. Healthcare professionals should oriented the patients to up-to-date resources with accurate information.

### Ethical Approval

Bu çalışmada insanlardan ya da hayvanlardan elde edilen kaynaklar kullanılmadığından etik kurul onayı alınmamıştır.

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The authors declare that this study received no financial support.

### Conflict of Interest

The authors deny any conflicts of interest related to this study.

### Author Contributions

Design: SDB, DH, KB, AE. Data collection and processing: SDB, KB. Analysis and interpretation: SDB, AT, AE. Literature review: SDB, DH, AT, KB. Writing: SDB.

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