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Evaluation of Superficial Parotidectomy Videos on Youtube in Terms of Surgical Education

ABSTRACT

Background: This study examined the videos of superficial parotidectomy on Youtube and aimed to evaluate whether these videos meet the basic educational steps with laparoscopic surgery video educational guidelines.

Methods: We analyzed the results of a Youtube search with the keywords "superficial parotidectomy surgery, superficial parotidectomy, parotidectomy" until February 2020. After the exclusion criteria, we evaluated the remaining 38 videos with parameters such as the total number of views, subscribers, likes and dislikes, comments, etc. We also analyzed the videos with the laparoscopic surgery video educational guidelines' video quality assessment tool.

Results: Of the 38 evaluated videos, 10 were high quality (26.3%) and 28 were low quality (73.7%). No statistically significant difference was observed between the study groups in the rates of music, the number of subscribers, comments, video age (days), likes/subscribers, likes/views, views/subscribers, and likes ($P > .05$ for all comparisons). On the other hand, the number of views, the number of likes, (likes × views)/100 ratios, (likes−dislikes)×100, likes + dislikes, likes−dislikes, and Video Power Index are significantly higher for high-quality videos (for all comparisons, $P < .05$). As expected, all laparoscopic surgery video educational guideline scores were significantly higher for all parameters in the high-quality video group, while no significant difference was observed for the sixth item ($P = .386$).

Conclusion: We found that popular YouTube videos about superficial parotidectomy surgeries were significantly lacking in information regarding case presentation, treatment options, intraoperative and postoperative complications, and the healing process. We believe that videos used as a source of information should be recorded by more qualified professionals and that the content should be presented with these missing features.

Keywords: Online education, superficial parotidectomy, surgical education, youtube

INTRODUCTION

Superficial parotidectomy is a common operation in ear, nose, and throat practice. It is considered the gold standard method in treating benign or some malignant tumors of the parotid gland. Recognition and dissection of the facial nerve are crucial stages of parotid surgery. It is vital to be equipped with anatomy knowledge, surgical experience, and possible complications to operate safely. This can only be achieved with adequate training.

Monitoring the operations performed by experienced surgeons always has an important place in surgical training. Even if this is usually provided in the clinic where physicians are trained, it is often not possible to follow the approaches or surgical techniques of other hospitals or educational institutions. With the advancement of technology, the role of videos in surgical education is increasing.[1] Compared to live training sessions, the fact that the videos are easier to access and can be watched again is the reason for preference.[2] Especially during the COVID-19 pandemic, the inability to perform elective surgeries for a while caused patient victimization and adversely affected the training of physicians. Furthermore, most of the physicians sought alternative education methods in this period.

Youtube is the video platform that surgeons most frequently used for educational purposes.[3] There has been a significant increase in superficial parotidectomy videos uploaded

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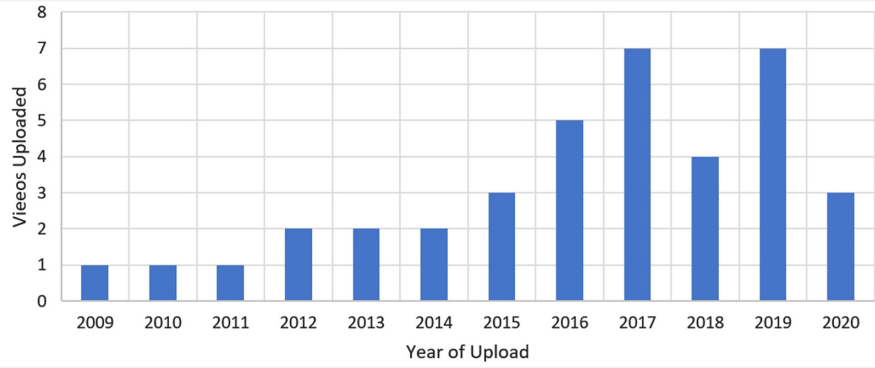

Figure 1. Number of videos uploaded per year.

to Youtube in the last 5 years compared to previous years (Figure 1). However, as we know, some videos on Youtube have been uploaded for advertising purposes. It cannot be thought that every surgical video will contribute to education. This is where the educational quality of these videos comes into play. Several studies are examining the quality of Youtube videos showing surgical procedures.[4–6] This study aimed to examine the superficial parotidectomy videos on Youtube in terms of surgical education quality.

MATERIAL AND METHODS

Technical Video Analysis

Videos outside of a standard superficial parotidectomy procedure were excluded from our study. Duplicate videos and videos using languages other than English were also excluded. After removing the videos, all remaining videos were evaluated and scored by a resident and 2 otolaryngologists (TÇ, BD, GAY) experienced in parotidectomy surgery. Ethics committee approval and patient consent were not required as no patient data were used and publicly available data were used.

Video sources were determined as surgeon/practitioner, hospital/clinic, and university. The number of likes, dislikes, comments, views, and subscribers was recorded. The number of days since the video was uploaded, the number of views per day, the total duration of the video, the likes rate (likes × 100/[likes + dislikes]), the view rate, and the Video Power Index (VPI; like ratio x view ratio/100) were calculated. Didactic sound, music, image quality, didactic steps, and presence of subtitles were also noted.

Video Reliability Analysis

All videos were rated using the laparoscopic surgery video educational guidelines' (LAPVEGaS) surgical video quality assessment tool, a previously described 9-item questionnaire, each ranging from 0 (item not presented) to 2 (item comprehensively presented).

The questions were as follows: (i) Are the authors and institution information specified? (ii) Is there a formal presentation of the case, including patient details and imaging, indication for surgery, comorbidities, and previous surgeries? (iii) Have the patient's position, entry points, extraction site, and surgical team been defined? (iv) Is the surgical procedure presented in a step-by-step standardized manner? (v) Are intraoperative findings shown regarding normal anatomy? (vi) Are relevant outcomes of the procedure presented, including operative time, postoperative morbidity, and histology? (vii) Are additional graphical tools such as diagrams, snapshots, and photographs used to illustrate anatomical landmarks, relevant or unexpected findings, or provide additional educational content? (viii) Is English audio/written narration provided? (ix) Is the image quality suitable for the continuous clear view of the work area, and is the video fluidity at the appropriate speed?

A total of 11 points are recommended in the LAP-VEGaS video evaluation tool to describe a high-quality video. Regarding LAP-VEGaS scores, we divided all included videos into 2 groups, namely, low-quality videos (<11 total LAP-VEGaS scores) and high-quality videos (≥11 LAP-VEGaS scores).

Statistical Analysis

The kappa coefficient was used to analyze the agreement between the 2 independent researchers. The Shapiro–Wilk test was used to assess the normality of continuous variables. The Mann–Whitney *U* test was used to compare ordinal variables with non-normally distributed continuous variables. An independent sample *t*-test was used to compare homogeneous continuous variables. Pearson's chi-square test or Fisher–Freeman–Halton test was used to compare categorical variables. In all analyses, a *P*-value of <.05 was taken to indicate statistical significance. All statistical analyses were performed using Statistical Package for the Social Sciences Version 20 (IBM corp., Armonk, NY, USA).

MAIN PONTS

- Youtube is one of the most frequently used online source of virtual surgery education platform due to its popularity and ease of access, and its use is alincreasing.
- Most of the popular Youtube videos on superficial parotidectomy are significantly lacking in case reports, treatment options, intraoperative and postoperative complications, and the healing process.
- Evaluating surgical videos on open access platforms such as YouTube before they are published and going through a standard review process may help increase the educational value of the video materials.

Table 1. High-Quality Videos (LAP-VEGaS Score ≥11, n = 10)

Number	Title and Link	1.Author and Institution			2.Case Presentation			3.Positioning and Surgical Team			4.Surgical Procedure			5.Intraoperative Findings			6.Procedure Outcomes			7.Additional Diagrams or Photos			8.English Audio/ Subtitle			9.Image Quality and Video Stream			Total LAP-VEGaS Score		
		R1	R2	R3	R1	R2	R3	R1	R2	R3	R1	R2	R3	R1	R2	R3	R1	R2	R3	R1	R2	R3	R1	R2	R3	R1	R2	R3	R1	R2	R3
1	https://www.youtube.com/watch?v=Ta0b8HJBDF0&ab_channel=MAMCSurgeryUpdate	2	2	2	2	1	2	2	0	1	2	2	2	2	1	2	1	1	0	2	2	0	2	2	1	1	0	1	16	11	11
2	https://www.youtube.com/watch?v=38RFHkZLptU&ab_channel=RS	2	2	2	1	0	0	2	1	2	2	2	2	2	2	2	1	1	0	0	1	2	2	2	2	1	2	2	13	13	14
3	https://www.youtube.com/watch?v=crL5ARYybuY&ab_channel=DomainSurgical	2	2	2	1	1	1	1	0	1	2	2	2	2	2	2	2	1	2	0	0	0	2	2	2	2	2	2	14	12	14
4	https://www.youtube.com/watch?v=rRN6RgudOFI&ab_channel=MZawahir	2	1	2	2	1	1	2	2	1	2	2	1	2	1	1	2	0	1	1	0	1	2	2	2	2	2	1	17	11	11
5	https://www.youtube.com/watch?v=luDI5dLz1No&ab_channel=MayoClinic	2	2	2	0	0	0	2	2	2	2	2	2	2	2	2	0	0	0	1	1	1	2	2	2	2	2	2	13	13	13
6	https://www.youtube.com/watch?v=dBgZpD1DW7g&ab_channel=learnhead%26necksurgery	1	1	1	0	0	1	2	1	2	2	2	2	2	2	2	0	0	0	1	1	1	2	2	2	2	2	2	12	11	13
7	https://www.youtube.com/watch?v=47uFqQ1H1gg&ab_channel=DrKevinSoh	2	2	2	2	2	2	1	1	1	2	2	1	2	2	0	1	0	0	1	0	0	1	2	0	1	2	2	13	13	8
8	https://www.youtube.com/watch?v=DF6vpPDTMAI&ab_channel=KONSTANTINOSAPOSTOLOPOULOS	2	2	2	1	1	2	1	1	2	2	2	2	2	2	2	0	0	0	2	0	0	2	2	2	1	1	2	13	11	14
9	https://www.youtube.com/watch?v=ziqWetDBwcA&ab_channel=DineshPal	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	0	1	0	0	0	0	2	2	1	2	2	2	11	12	11
10	https://www.youtube.com/watch?v=XxiR2r8Z8QI&ab_channel=Dr.MuraliChandNallamothu	0	0	0	2	2	0	2	2	1	2	2	1	2	2	2	0	0	0	0	0	0	2	2	2	1	1	1	11	11	7

LAP-VEGaS, laparoscopic surgery video educational guidelines.

Table 2. Comparison of the Superficial Parotidectomy Procedures in Regards to LAP-VEGaS Scores

		Low-Quality Videos (n = 28)	High-Quality Videos (n = 10)	
		n (%), Median (Min-Max)	n(%), Median (Min-Max)	*P*
Music	Yes	11 (39.3)	4 (40)	.627
	No	17 (60.7)	6 (60)	
Image quality	1080p	10 (35.7)	4 (40)	.082
	720p	3 (10.7)	4 (40)	
	480p	7 (25)	2 (20)	
	360p	3 (10.7)	0 (0)	
	240p	5 (17.9)	0 (0)	
Narrator's Voice	No	6 (21.4)	2 (20)	.899
	Yes	22 (78.6)	8 (80)	
Subtitles	Yes	14 (50)	4 (40)	.719
	No	14 (50)	6 (60)	
Uploader	Surgeon/practitioner	20 (71.4)	5 (50)	.783
	Hospital/clinic	4 (14.3)	5 (50)	
	Medical website	1 (3.6)	0 (0)	
	University	1 (3.6)	0 (0)	
	Other	2 (7.1)	0 (0)	
Country	USA	21 (75)	5 (50)	.345
	China	1 (3.6)	0 (0)	
	India	3 (10.7)	1 (10)	
	England	1 (3.6)	2 (20)	
	Italy	2 (7.1)	2 (20)	
Technical analysis of the videos				
Number of subscriber		581.5 (0-84800)	18050 (0-620000)	.082
Number of view		2476.5 (62-98480)	27977.5 (163-290741)	**.021**
Number of like		9 (0-355)	173.5 (5-1700)	**.002**
Number of dislike		2 (0-31)	11.5 (0-90)	**.041**
Number of comment		1 (0-34)	8 (0-71)	.151
Video length (second)		549 (302-61724)	1228 (501-4294)	**.021**
Time passed since video upload (days)		1497.5 (338-3817)	1268 (401-4174)	.568
View/day		1.6 (0.04-38.2)	25.7 (0.41-114.2)	**.009**
Like/subscriber		0.005 (<0.001-0.88)	0.003 (<0.001-1.33)	.858
Like/view		0.005 (<0.001-0.03)	0.11 (0.002-0.31)	.076
View/ subscriber		1.19 (0.05-769.3)	0.87 (0.01-538.41)	.565
Like × view/100		275.1 (0-247083.55)	70860.2 (8.15-2096242.61)	**.006**
Like ratio		90.2 (0-100)	96.5 (84.26-100)	.051
Like−dislike × 100		0.3 (0.03-3.14)	1.09 (0.2-3.1)	**.023**
Like+dislike		11 (0-386)	193 (5-1723)	**.002**
Like−dislike		7.5 (3-324)	154 (5-1677)	**.001**
VPI		1.2 (0-35.2)	24.8 (0.41-101.6)	**.008**

The bold values indicate statistically significant *P* Values.
VPI, Video power index; LAP-VEGaS, laparoscopic surgery video educational guidelines.

RESULTS

A significant agreement was observed among the reviewers who evaluated the video analysis (kappa score of 0.76, $P = .031$, important agreement). Of the 38 evaluated videos, 10 (26.3%) were high-quality (Table 1) and 28 (73.7%) were low-quality videos.

Most of the low-quality videos were uploaded by the surgeon/physician [20(71.4%)], while the high-quality videos were shared equally between the surgeon/physician and the hospital/clinic. Universities' video rates were 0(0%) in the high-quality video group and 1(3.6%) in the low-quality video group. In general, there was no significant difference between the study groups in terms of the source of the videos ($P = .783$)(Table 2).

Considering the presence of the narrator's voice, there was no significant difference between the high-quality group and the low-quality group, and the rates were similar [8(80%) vs. 22(78.6%), $P = .899$]. Although there was no significant difference in the high-quality group compared to the low-quality group, a higher rate of image quality (720p and above) was observed [13(46.4%) vs. 8(80%), $P = .082$]. The high-quality video group added subtitles to the videos at a lower rate than the low-quality video group, and no significant difference was found [4(40%), 14(50%), respectively, $P = .719$] (Table 2).

Regarding viewer attention and technical video analysis, the median number of subscribers, views, and likes in the low-quality group, with min-max values, were 581.5(0-84800), 2476.5(62-98480), and 9(0-355), respectively. The same parameters were 18050 (0-620000), 27977.5(163-290741), and 173.5(5-1700), respectively, in the high-quality group. Video length was significantly lower in the high-quality group than in the low-quality group [1228 (501-4294) vs. 549(302-61724), $P = .021$] (Table 2).

When we look at the daily viewership rate, the number of daily views of the high-quality group was significantly higher than the low-quality group [1.6 (0.04-38.2) vs. 25.7 (0.41-114.2), $P = .009$].

No statistically significant difference was observed between the study groups in the rates of music, the number of subscribers, comments, video age (days), likes/subscribers, likes/views, views/subscribers, and likes ($P > .05$ for all comparisons) (Table 2).

On the other hand, the number of views, the number of likes, (likes × views)/100 ratios, (likes-dislikes)×100, (likes+dislikes), (likes−dislikes), and VPI are significantly higher for high-quality videos (for all comparisons, $P < .05$)(Table 2).

As expected, all LAP-VEGaS scores were significantly higher for all parameters in the high-quality video group than the low-quality video group, while no significant difference was observed for the sixth item [(vi) relevant outcomes of the procedure, including operative time, postoperative morbidity, and histology presented] ($P = .386$) (Table 3).

DISCUSSION

In our country, during residency, surgical training is given in universities and research and training hospitals.

Although the importance of one-to-one applied training under the supervision of a specialist physician (trainer) in surgical training is undisputed, the importance of video-assisted distance education is undeniable, especially in recent years.

In the last 10 years, parallel to the development of technology, smartphones, especially, have entered our lives and become widespread, allowing us to access the internet at any time. This has made education systems such as online education and distance education widespread. In the last 2 years, the whole world has met with the COVID-19 pandemic. Along with the pandemic, disruptions were experienced in the health system and assistant training processes, as in all areas. The fact that physicians in all branches took part in the epidemic stopped the services in their fields. The prolonged cessation of elective surgeries caused the training of residents to be interrupted.

Table 3. The Comparison of LAP-VEGaS Scores of the Superficial Parotidectomy Videos of the Study Groups

	Low-Quality Videos (Median/Min-Max)	High-Quality Videos (Median/Min-Max)	*P*
Authors and institution information	1 (0-2)	2(0-2)	**.031**
Formal presentation of the case, including patient details and imaging, indication for surgery, comorbidities, and previous surgery	0 (0-2)	1 (0-2)	**.013**
Position of patient, access ports, extraction site, and surgical team	1 (0-2)	1.5 (1-2)	**.009**
The surgical procedure is presented in a standardized step by step fashion	1.5 (1-2)	2 (2-2)	**.019**
The intraoperative findings are clearly demonstrated, with constant reference to the anatomy	1 (0-2)	2 (1-2)	**<.001**
Relevant outcomes of the procedure are presented, including operating time, postoperative morbidity, and histology when appropriate	0 (0-2)	0 (0-2)	.386
Additional graphic aid is included such as diagrams, snapshots, and photos to demonstrate anatomical landmarks, relevant or unexpected finding, or to present additional educational content	0 (0-1)	0.5 (0-2)	**.044**
Audio/written commentary in English language is provided	1 (0-2)	2 (1-2)	**.003**
The image quality is appropriate with constant clear view of the operating field. The video is fluent with appropriate speed	1 (0-2)	2 (1-2)	**.006**
Total score	7 (1-10)	12.5 (11-15)	**<.001**

Naturally, this situation has significantly increased the place of online education in our lives.

Online surgery training videos have become an essential source of information, presenting the steps and different surgical procedures from the surgeon's perspective. In this particular period we live in, the process of surgical education can be shortened more effectively with visual didactic resources compared to written sources.[7,8] In addition, social media is an undeniably crucial personal advertising platform for professional healthcare professionals as it is for everyone. As a result, there has been a significant increase in online surgical videos recently.[9] Although online education resources lag behind traditional learning methods such as textbooks, lectures, and journal articles, a significant portion of surgical trainees benefit from online education. Glass et al[10] surveyed 773 surgical residents enrolled in various programs nationwide. They found that 57% of residents used textbooks and 36% used online videos/resources.

Regarding the choice of learning tools used, Rapp et al[3] stated that although 90% of the intern physicians who participated in the survey preferred traditional working methods, 64% of them found the training videos positive.

In this study, we wanted to evaluate the quality of superficial parotidectomy videos on Youtube in terms of surgical training. For this purpose, we used the LAP-VEGaS video evaluation tool, a validated evaluation tool that has been used in many publications before.[11-14] Of the 38 videos we reviewed with LAP-VEGaS, 28 were low quality and 10 as high quality. Similar to our study, it has been shown in the literature that the educational quality of online videos on Youtube is low. In a study by Luu et al[12], they evaluated neck dissection videos on Youtube with the LAP-VEGaS video evaluation tool from an educational point of view and found that only 3 of 34 videos were of high quality and the others were of low and medium quality. In another study evaluating the educational quality of "YouTube" videos for facelift, it was found that Youtube videos were insufficient in discussing the essential criteria, especially in terms of pre-/post-operative points such as indications, patient selection, and possible complications.[6] Chapman et al[14] evaluated online laparoscopic sleeve gastrectomy videos using the LAP-VEGaS guidelines and showed that 89% of the videos met less than half of all criteria. Addar et al[15] reviewed the quality of 16 videos describing splinting of the fractured distal radius and rated 10 of the 16 videos as "unsatisfactory in terms of training videos.

The LAP-VEGaS video evaluation tool considers 9 items when evaluating videos as educational. Considering the ratio of the videos to present these titles sufficiently, it was seen that the videos we mainly examined covered the fourth item. In this item, it was questioned whether the surgical procedure was presented in a standardized step-by-step manner. When we evaluate the videos on Youtube, we see that the videos generally meet this point adequately. When we look at the items that videos meet the least, we come across items 2, 6, and 7. In the second question of the LAP-VEGaS video evaluation tool, the detailed presentation of the patient, such as the indication for surgery, accompanying comorbidities, and imaging results of the case, if any, is questioned. In item 6, operation time, postoperative morbidity, and related results of the procedure are expected. In item 7, it is questioned whether additional graphical tools such as diagrams, snapshots, and photographs are used to show anatomical landmarks, relevant or unexpected findings, or provide additional educational content.

This is where surgical videos on Youtube generally lack surgical training. It is crucial to make the correct diagnosis and evaluate the results correctly, that is, to give the pre-and postoperative processes as a whole, not just the operation part. In the literature, it has been emphasized that the same points are missing in the videos on Youtube.[9,11]

When the videos were evaluated in terms of the narrator's voice, no significant difference was found between the groups. However, the accompaniment of the narrator's voice increases the educational quality of the videos as it provides the audience with the opportunity to provide additional information about the surgery.

Calculation of Kappa coefficients was used to verify reliability among video raters. Although the criteria used to define the proportion of agreement for κ values varied,[16] the most commonly cited scale was used. (0.01-0.20 = poor, 0.21-0.40 = reasonable, 0.41-0.60 = moderate, 0.61-0.80 = important, and 0.81-0.99 = almost excellent).[17-19] This significant degree of consistency between raters (kappa score of 0.76, $P = .031$) strengthens the reliability of the ratings described above.

When we compared the videos in both groups according to their technical characteristics, there was a significant difference in the number of views and likes in favor of high-quality videos. In contrast, Deal et al[20] evaluated 160 cholecystectomy surgery videos and observed no correlation between high-quality videos and the number of views or likes.

In studies conducted by different disciplines, no relationship was found between the educational quality of the videos and popularity parameters such as the number of views and likes on Youtube.[13,21,22]

Working Limitations

This study has some limitations. First of all, the video evaluation process involves subjectivity. Although the evaluators used a standard patterned video assessment tool, the subjectivity of some items creates differences in the judgments of the people who evaluate the video. Secondly, the evaluated videos were selected only from the Youtube video platform. Although other video-sharing resources can be evaluated, doctors' most frequently used resource has been evaluated here. Another limitation is the fact that surgical videos uploaded to Youtube are not always for educational purposes. Sometimes videos can be uploaded for personal or corporate advertising purposes and sometimes for patient information.

Although it is not realistic to expect surgical training criteria to be met in videos uploaded for such purposes, watching such videos by surgeons for educational purposes causes us to include them in the evaluation.

In this study, we analyzed the videos on Youtube in a specific period, but due to the nature of the Youtube platform, the number of views, the number of likes and dislikes, comments, and their proportions will change over time.

Although the LAP-VEGaS video evaluation tool, which we used recently, was prepared primarily for laparoscopic surgeries, as its name suggests, it was later preferred and validated in publications examining the educational quality of endoscopic and open surgeries.[11,12,14] Therefore, we did not see any problems in using this scale in this study.

CONCLUSION

Although Youtube is not the first choice surgical education platform for doctors, it is the most frequently used online video platform due to its popularity and ease of access, and its use is also increasing. In addition, it is necessary to conduct comparative studies with different digital platforms to determine the best online source of virtual surgery education.

In our study, only 26.3% of YouTube videos presenting superficial parotidectomy surgery were defined as high-quality videos. Our study found that popular Youtube videos about these surgeries significantly lacked case presentation, treatment options, intraoperative and postoperative complications, and information about the healing process.

The LAP-VEGaS guidelines for evaluating videos were created to help standardize surgical videos and make them more useful. These videos, which are used as a source of information, should be recorded by more qualified professionals, and their contents should be presented objectively with all information about all treatment options, complications, and healing processes. In the future, we believe that evaluating surgical videos with these guidelines and undergoing a standardized review process before posting on open-access platforms such as Youtube can help increase the educational value of video materials.

Ethics Committee Approval: Ethics committee approval was not required as the study was in an observational design using only publicly available data.

Peer-review: Externally peer-reviewed.

Author Contributions: Concept - B.D, G.A.Y.; Design - B.D., G.A.Y.; Supervision - T.Ç., G.A.Y.; Materials - T.Ç., B.D., G.A.Y.; Data Collection and/or Processing - T.Ç., B.D., G.A.Y.; Analysis and/or Interpretation - B.D., G.A.Y.; Literature Review - T.Ç., B.D., G.A.Y.; Writing - B.D., G.A.Y.; Critical Review - B.D., G.A.Y.

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