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A Social Media Perspective of Rotationplasty Surgery on TikTok

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Abstract

Background: To characterise publicly available TikTok content related to rotationplasty, including post characteristics, sentiment, engagement, and major discussion themes.

Methods: This cross-sectional analysis utilized TikTok, a social media application where users share posts in the form of video or photographic compilations, to evaluate social media posts related to rotationplasty. Public TikTok posts were searched before January 2024 and subsequently screened using the selected hashtag “#Rotationplasty” alone. Posts from patients, physicians, hospitals or organisations, friends or family of the patient, and other medical professionals were included. Non-operative patients, non-medical posts, reactionary videos to prior posts of content creators, and unrelated advertising for orthopedic surgery physician practices or rehabilitation clinics were excluded. Data collected for each post included total number of likes, tone (positive, neutral/negative), gender (male/female), time of video (preoperative versus postoperative), and presence of tumor diagnosis. Variables regarding surgical commentary included: formal physical therapy, home rehabilitation, activities of daily living, incision/scar, pain, complications, and imaging. Descriptive statistics were used to summarize the data. Pearson’s chi-square test or Fisher’s exact test, as appropriate, was used for categorical comparisons, and odds ratios (ORs) with 95% confidence intervals (CIs) were calculated.

Results: 68 social media posts met inclusion criteria with a total of 35.6 million views and 2.6 million likes. Female patients were represented in 43 posts (63.2%). The right lower extremity was featured in 43 posts (63.2%). Content creators were predominantly 30 patients (44.1%) and 17 physicians (25%), with 49 posts (72.1%) largely positive in sentiment. The majority of content was postoperative (41; 60.3%) and mentioned malignancy (33; 48.5%), with a focus on patient progress updates (16; 53.3%). The most discussed topics included activities of daily living (27; 39.7%), range of motion (50; 73.5%), and educational content (36; 52.9%). Imaging appeared in 15 (22.1%) of posts, primarily using animation. Clinical methods were mentioned by physicians in 7 (41.2%) of their posts. Overall mobility was discussed in 53 (77.9%) of posts. No evaluated content characteristic was significantly associated with post sentiment (all $p > 0.05$).

Conclusion: Rotationplasty-related TikTok content was predominantly postoperative and positive in tone, frequently emphasizing mobility, functional recovery, and activities of daily living. These findings highlight the presence of rotationplasty-related content on social media and suggest that orthopedic surgeons should consider discussing online information during perioperative counselling. Future studies should evaluate the accuracy and educational quality of this content and its influence on patient expectations and decision-making.

Categories: Oncology, Orthopedics
Keywords: oncology, orthopedics, perception, social media, tik tok

Introduction

Rotationplasty, a limb-salvage surgery primarily for tumors near the knee, blends oncological and reconstructive techniques [1]. Originating in the early 20th century, it has notably advanced in treating pediatric oncology cases like osteosarcomas, Ewing sarcoma, and congenital limb malformations [1,2]. The procedure entails removing the tumor with a wide margin, then rotating and reattaching the distal limb, thus transforming the ankle into a functional neo-knee [1,2].

Studies have shown in the right patients that this method offers increased mobility and fewer lifestyle restrictions compared to endoprosthesis or amputation, with younger patients able to return to sports [3,4]. Prior studies have shown lower postoperative complications with rotationplasty compared to endoprosthesis, underscoring its safety and effectiveness [5-8]. Despite these benefits, rotationplasty presents psychological and physical challenges, chiefly due to its cosmetic impact on the backward orientation of the toes, which can be a significant cultural and social concern [9].

Social media is widely utilized by billions of people worldwide, with popular platforms attracting millions of users daily [10]. Among these platforms, TikTok stands out with 150 million active monthly users in the United States alone [11,12]. The average user spends over two and a half hours daily consuming social media [11]. A majority of TikTok's user base is aged between eighteen and twenty-nine [12]. As the use of social media continues to grow, it has become an essential tool for hospitals and orthopedic surgeons to establish their presence and engage with patients [13,14]. Leveraging their community standing, these medical professionals aim to connect with patients through various platforms, fostering better communication and understanding [15]. Notably, patient-reported outcomes (PROs) have emerged as a common quality metric in orthopedic surgery, further emphasizing the importance of understanding patient perceptions and experiences, with more patients providing reviews on websites and online platforms [16,17]. Previous studies across spine, hand, shoulder and elbow, and foot and ankle surgery have examined social media use by both patients and orthopedic surgeons [16,18-21].

Social media platforms like TikTok have become valuable spaces for individuals to share experiences, seek advice, and gain community support [22]. Publicly available content on these platforms can provide perspectives on uncommon procedures that may be less represented in traditional clinical literature [19]. Given the rarity and unique functional and psychosocial implications of rotationplasty, understanding how the procedure is portrayed and discussed on social media may help inform patient counselling and clinical practice. Therefore, this study aimed to characterize publicly available TikTok posts related to rotationplasty by evaluating post and creator characteristics, sentiment, engagement, and major content themes.

Materials And Methods

Searchability of the chosen social media platform

TikTok is a social media platform that allows users to share videos of varying lengths, often accompanied by music or audio. Posts may consist of recorded videos, compilations of photographs, or combinations of both. Users can include hashtags in their captions to categorize content and improve discoverability. Hashtags consist of the "#" symbol followed by a keyword or phrase without spaces (e.g., #Rotationplasty) and can be used to identify posts related to a specific topic through TikTok's search function.

Study design

An initial search of TikTok looked at variations of "#", given the rarity of the surgery. #Rotationplasty yielded the most results; other variations of search terms (#VanNesRotation, #VanNesRotationplasty, #Rotationplastyprocedure) yielded fewer than 10 posts and were not considered. #Rotationplasty was selected because it yielded the greatest number of relevant posts among the search terms evaluated.

Our initial data pull surveyed TikTok for all posts before January 2024 labelled with #Rotationplasty. This search strategy has successfully identified 303 posts. After removing duplicate posts, we were left with 110 posts. Duplicate posts were defined as posts containing identical content without additional commentary (e.g., two TikTok videos featuring the same rotationplasty animation without added context). Evaluation with exclusion criteria yielded 68 posts from 65 creators. The 68 posts were then independently evaluated, and data extracted by two reviewers. The variables identified in posts were categorized into distinct categories: general and surgical commentary. General variables assessed include likes, tone of post (positive, negative, neutral), and gender (male/female). Posts were classified as positive if they conveyed favorable experiences, outcomes, or perspectives regarding rotationplasty; negative if they emphasized unfavorable experiences, complications, or dissatisfaction; and neutral if they presented factual or educational information without a clear positive or negative sentiment. Surgical commentary was evaluated for the presence or absence of the following variables: formal physical therapy, home rehabilitation, activities of daily living (ADL), incision/scar, pain related to postoperative course, complications, pathology, and imaging.

This study analyzed publicly available TikTok videos and did not involve interaction with human participants or collection of private, identifiable information. As such, the study did not constitute human subjects research and did not require institutional review board approval.

Inclusion and exclusion criteria

Included posts were from patients and physicians providing education, pre- and post-operative experiences. Excluded posts were identified as non-operative patients, non-medical posts, reactionary videos to prior posts of content creators, and unrelated advertising for orthopedic surgery physician practices or rehabilitation clinics.

Statistical analysis

Data capture, descriptive statistics and statistical analysis were done with Microsoft Excel X (Microsoft Corporation, Redmond, WA). The total number of responses per category was evaluated for the overall total they represented, as well as the per cent of available posts containing those elements (calculated as: variable of interest/total posts multiplied by 100). Pearson's chi-square test or Fisher's exact test, as appropriate, was

used to evaluate associations with post tone as the variable of interest. For inferential analyses, post sentiment was dichotomized as positive versus non-positive, with negative and neutral posts comprising the non-positive group. Odds ratios (ORs) with 95% confidence intervals (CIs) were calculated, with statistical significance set at $\alpha = 0.05$.

Results

In our study, we analyzed a total of 68 social media posts that satisfied our inclusion criteria. These posts cumulatively amassed 35,572,524 views, with a median of 22,700 views per post (IQR, 3,815-70,800). The total number of likes across all posts reached 2,614,775, with a median of 924 likes per post (IQR, 125-2,313). The demographic distribution of the posts indicated that a majority were made by 43 females (63.2%). The right lower extremity was the most frequently mentioned or depicted body part, also accounting for 43 posts (63.2%) (Table *1*).

Variable	Present	Absent
Views (total)	35,572,524	-
Views (average)	523,125	-
Likes (total)	2614775	-
Likes (average)	38453	-
Positive Post	49	-
Negative Post	2	-
Neutral Post	17	-
Male	25	-
Female	43	-
Right lower extremity	43	-
Left lower extremity	25	-
Tumor diagnosis provided	33	35
Activities of daily living	27	41
Incision/scar	13	55
Imaging	15	53
Pain	2	66
Physical therapy	11	57
Reoperation	2	66
Timing	64	4
Brace	20	48
Mobility	53	15
Made to educate/increase awareness	36	32

TABLE 1: Patient post statistics on TikTok for the assessed study variables.

In terms of the contributors' backgrounds, posts were created by 30 patients (44.1%), 17 physicians (25%), nine hospitals or organizations (13.2%), nine friends or family of the patient (13.2%), and three other medical professionals (4.4%). The sentiment analysis of the posts revealed 49 positive (72.1%), two negative (2.9%), and 17 neutral (25%) posts. Activities of daily living (ADL) were discussed in 27 (39.7%) of the posts, incisions or scars in 13 (19.1%), and range of motion (ROM) of the neo joint was seen in 50 (73.5%). Among the posts made by patients, patient stories were shared in 15 (50%) of the posts, and 16 (53.3%) of patients provided updates on their progress.

Furthermore, 36 (52.9%) of posts included educational content. Imaging was featured in 15 (22.1%) of posts, with animation used in 13 (86.7%) and actual medical images in two (13.3%). Specific clinical methods were mentioned in seven (41.2%) of the posts by physicians, while none of the 68 posts covered research or fundraising activities. Physical therapy was depicted in 11 (16.2%) of the posts. Tumor diagnosis was provided in 33 (48.5%) of posts, with 26 (76.5%) of these specifying osteosarcoma. Regarding the timing of the posts in relation to the treatment journey, two (2.9%) were categorized as preoperative, 41 (60.3%) as postoperative, and 21 (30.9%) depicted before-and-after scenarios. Additionally, pain was mentioned in two (2.9%) of posts, multiple operations in two (2.9%), and braces were featured in 20 (29.4%) of posts. Overall mobility was a topic of discussion in 53 (77.9%) of the analyzed posts.

No significant associations were identified between post sentiment and activities of daily living, incision/scar, joint range of motion, imaging, physical therapy, timing, brace use, mobility, educational content, progress updates, clinical practice, or patient stories (all p> 0.05) (Table 2). Physical therapy demonstrated the greatest odds of association with post sentiment (OR 2.56, 95% CI 0.68-9.70; p= 0.16), while progress updates demonstrated the lowest odds (OR 0.29, 95% CI 0.05-1.44; p= 0.11); neither association reached statistical significance. Pain and multiple operations were each reported in only 2 of 68 posts (2.9%). Given the small cell counts, Fisher's exact tests were performed and demonstrated no significant association between post sentiment and either pain (p= 0.075) or multiple operations (p= 1.00).

Variable	Odds ratio (95% CI)	Test statistic	p-value
Activities of daily living	1.78 (0.60–5.30)	1.08	0.29
Incision/scar	1.83 (0.51–6.53)	0.88	0.35
Joint ROM	1.50 (0.42–5.31)	0.40	0.53
Imaging	0.92 (0.25–3.35)	0.02	0.90
Physical therapy	2.56 (0.68–9.70)	2.00	0.16
Timing	0.36 (0.05–2.77)	1.03	0.31
Brace	0.81 (0.24–2.66)	0.12	0.73
Mobility	1.73 (0.42–6.98)	0.60	0.44
Made to educate/increase awareness	1.79 (0.60–5.30)	1.10	0.29
Progress update	0.29 (0.05–1.44)	2.48	0.11
Clinical practice	2.11 (0.42–10.50)	0.86	0.35
Patient story	0.58 (0.14–2.33)	0.60	0.44

TABLE 2: Association between rotationplasty TikTok content characteristics and post sentiment.

Significance was set at a p< 0.05 for our statistical comparisons. Statistically significant results are indicated with an asterisk (*).

Discussion

The principal finding of this study was that TikTok content related to rotationplasty was predominantly positive and postoperative, with patients representing the largest group of content creators. Despite the rarity of rotationplasty, the included posts accumulated over 35 million views, demonstrating public engagement with content surrounding this uncommon procedure. Other orthopedic studies examining TikTok content have identified anywhere from several hundred to thousands of posts [18,21]; however, given the rarity of rotationplasty, only 68 posts met the inclusion criteria in the present study. Posts frequently emphasized mobility, range of motion, activities of daily living, education, and postoperative progress. However, no individual content characteristic evaluated in this study was significantly associated with post sentiment. These findings demonstrate that TikTok provides a platform through which patients can share their postoperative experiences and clinicians can provide education regarding rotationplasty.

The majority of posts in our study conveyed positive sentiment. Notably, females represented 43 (63.2%) of content creators despite the historically greater incidence of osteosarcoma among males, reported at 5.4 per million persons per year in males compared with 4.0 per million in females [23]. This discrepancy may reflect differences between the population affected by these conditions and the population choosing to publicly share their experiences on social media. Previous literature suggests greater use of visually oriented social media platforms among females, while males may favor text-based platforms [22]. Additionally, research by

Facebook indicates that female users are more inclined to share personal issues, while male users tend to share more abstract topics [24]. These differences highlight an important consideration when interpreting social media content: individuals who publicly share their experiences may not be representative of the broader patient population. Furthermore, age and ethnicity could not be reliably determined from the posts included in this study, limiting further characterization of the population represented on TikTok.

Functional outcomes represented a prominent theme among rotationplasty-related posts. Overall mobility was discussed or demonstrated in 53 posts (77.9%), range of motion of the neo-knee was demonstrated in 50 posts (73.5%), and activities of daily living were discussed in 27 posts (39.7%). This emphasis is particularly relevant given the importance of function and mobility when considering rotationplasty in comparison with other reconstructive options. Prior gait analysis of patients undergoing rotationplasty demonstrated only minor asymmetries in stride duration, length, cadence, velocity, and stance-swing ratio compared with healthy subjects, with superior knee motion reported in rotationplasty patients compared with amputees [25]. Additionally, a cohort study of 28 patients who underwent rotationplasty demonstrated satisfactory psychological well-being, including self-esteem, integration of the prosthetic limb into body image, minimal anxiety and depression, good quality of life, and favorable temperament and character traits [9]. Together, these findings suggest that the emphasis on mobility and daily function observed on TikTok parallels functional and psychosocial outcomes that have traditionally been important in the clinical evaluation of rotationplasty.

The engagement observed in this study also highlights the potential role of social media in patient education and expectation-setting surrounding rotationplasty. Educational or awareness-related content was present in 36 posts (52.9%), and physicians represented the second most common group of content creators. Social media may therefore provide both peer-to-peer accounts of the patient experience and clinician-generated information regarding an uncommon procedure with which prospective patients and their families may have limited familiarity. For medical professionals involved in preoperative and postoperative care, understanding the information patients encounter online may be particularly important given the unique functional and cosmetic considerations associated with rotationplasty. At the same time, prior studies evaluating orthopedic content on social media have demonstrated the potential for misinformation [26]. The predominantly positive and postoperative nature of the content identified in the present study should therefore not be interpreted as representative of the complete spectrum of outcomes following rotationplasty. Rather, clinicians should recognize that these highly visible patient narratives may contribute to expectations regarding recovery, function, and quality of life and may provide an opportunity for discussion during perioperative counselling.

Several limitations should be considered when interpreting these findings. First, rotationplasty is an uncommon procedure, resulting in a relatively small sample of eligible TikTok posts and limiting the statistical power of comparisons between content characteristics and sentiment. Several variables occurred infrequently, resulting in sparse cell counts and wide confidence intervals. Second, this study evaluated a single social media platform using the #Rotationplasty hashtag. Relevant posts that did not include this hashtag may therefore have been excluded, and findings from TikTok may not be generalizable to content shared on other social media platforms. Furthermore, TikTok's algorithmic content curation and the time-dependent nature of post visibility and engagement may have influenced which posts were identified and their observed engagement metrics, introducing potential algorithmic and temporal bias. Additionally, individuals who choose to publicly share their rotationplasty experiences may differ systematically from those who do not, introducing selection and self-presentation bias. Patients with positive experiences may be more willing to share their postoperative progress, potentially contributing to the predominantly positive sentiment observed in this study. Demographic characteristics such as age and ethnicity also could not be reliably determined from the available content.

Despite these limitations, the findings demonstrate that rotationplasty-related content can achieve substantial engagement on TikTok and that discussions are largely centred on postoperative function, mobility, progress, and education. Social media may therefore represent an important source of information and peer support for patients and families considering rotationplasty. Orthopedic surgeons should be aware of the narratives and information patients may encounter online and consider addressing social media-derived expectations during perioperative counselling. Future studies examining multiple social media platforms and directly evaluating the accuracy and quality of rotationplasty-related content may further clarify the role of social media in patient education, expectations, and surgical decision-making.

Conclusions

TikTok provides a highly visible platform for patients, clinicians, and other content creators to share experiences and information surrounding rotationplasty. In this cross-sectional analysis, rotationplasty-related content was predominantly postoperative and positive in tone, with posts frequently highlighting mobility, range of motion, activities of daily living, and postoperative progress. Negative content was uncommon, with only two posts classified as negative, limiting meaningful conclusions regarding themes specific to negative content. Although rotationplasty-related posts demonstrated substantial engagement, this study characterized publicly available TikTok content and did not directly assess patient perceptions, the educational quality of posts, or their influence on patient expectations or decision-making. Furthermore,

the limited sample size, sparse subgroup counts, and wide confidence intervals limit the interpretation of nonsignificant associations between post characteristics and sentiment. Orthopedic surgeons should recognize that patients may encounter rotationplasty-related content on social media and consider discussing online sources of information during perioperative counselling. Future studies across multiple social media platforms should evaluate the accuracy and educational quality of rotationplasty content and directly assess its influence on patient expectations and decision-making.

Additional Information

Author Contributions

All authors have reviewed the final version to be published and agreed to be accountable for all aspects of the work.

Acquisition, analysis, or interpretation of data: Rohan Vemu, Sree M. Vemu, Caleb Casanova

Drafting of the manuscript: Rohan Vemu, Sree M. Vemu, Justin Aflatooni, Caleb Casanova

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Disclosures

Human subjects: All authors have confirmed that this study did not involve human participants or tissue. **Animal subjects:** All authors have confirmed that this study did not involve animal subjects or tissue. **Conflicts of interest:** In compliance with the ICMJE uniform disclosure form, all authors declare the following: **Payment/services info:** All authors have declared that no financial support was received from any organization for the submitted work. **Financial relationships:** All authors have declared that they have no financial relationships at present or within the previous three years with any organizations that might have an interest in the submitted work. **Other relationships:** All authors have declared that there are no other relationships or activities that could appear to have influenced the submitted work.

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