

Instagram and Spine Fusion: An Analysis of Social Media and Its Relationship to Patient Perception of Surgery

James M. Rizkalla, MD¹ , Brendan Holderread, MD¹,
William Hotchkiss, MD¹, Andrew Clavenna, MD¹,
Andrew Dossett, MD¹, Gerald Ogola, PhD¹, and Ishaq Syed, MD¹

Abstract

Study Design: Cross sectional study.

Objectives: To analyze posts shared on Instagram referencing spinal fusion for tone, gender, activities of daily living (ADLs), rehabilitation, incision, pain, neurological injury, and content of post.

Methods: Public Instagram posts, which were isolated and evaluated using the hashtags “#spinefusion” and “#spinalfusion.” All posts were analyzed by the authors for the variables previously listed. In total, 264 posts were included for investigation and analysis of patient perception of spine fusion through social media.

Results: Of all included posts, approximately 86% of posts had a positive tone. There was statistical significance between positive tone and activities of daily living (ADLs) ($P = 0.047$), as well as negative tone and persistent pain ($P = 0.008$). Adequate return to activities of daily living is perceived by patients as a positive outcome after surgery: odds ratio (OR) (95% CI) of 2.11 (1.01-4.39). Persistent post operative pain results negatively on perceived outcomes after surgery OR = 0.38 (0.18-0.78).

Conclusions: Reported outcomes after spine fusion has not been evaluated through social media avenues. This analysis of patients sharing their experience on social media after spinal fusion demonstrates that returning to activities of daily living is of the utmost importance to patients. Additionally, post-operative pain is a strong metric utilized by patients with their satisfaction after surgery.

Keywords

Instagram, spine, spine fusion, spinal fusion, social media

Introduction

Social media has become a prevalent part of societal communication that has continued to grow in popularity over the years.¹ Social media platforms such as Instagram, Twitter, and Facebook have developed mass followings resulting in millions of visits to their sites daily.¹ From a health standpoint, users of social media frequently reference online blogs, commentaries, or posts for information regarding their health issues.² More specifically, approximately 34% of users have visited blog sites or commentaries to find out additional information regarding diagnosis, treatment, or outcome of their pathology. Furthermore, 15% of internet users have utilized social media to discuss their general health concerns people within their social network.² As a result, there is an upward trend of social media utilization to discuss specific health issues.²

Social media has assisted in creating streamlined means of communication between provider and patient, which has led to improved communication between both parties.³ This has proven to be a promising avenue for enhanced communication between provider and patient. Social media has been effectively utilized in multiple facets of medicine, including orthopedic surgery.^{4,5} Patient utilization of social media has been

¹ Department of Orthopaedic Surgery, Baylor University Medical Center, Dallas, TX, USA

Corresponding Author:

James Rizkalla, Baylor University Medical Center, 3500 Gaston Avenue, Dallas, TX 75246, USA.
Email: jrzkall@gmail.com



evaluated after hip arthroscopy, shoulder and elbow surgery, anterior cruciate ligament surgery, total joint arthroplasty, and pediatric scoliosis.⁶⁻¹⁰ These evaluations have used social media as an adjunct tool to assess patient satisfaction, their overall progression, and long term rehabilitation after orthopedic surgery.⁶⁻¹⁰ With regard to adult spinal conditions, little has been investigated regarding perceived patient outcomes via reports on social media. Further understanding of patient perceived outcomes, through social media, may present different results from in-office metrics that are routinely used today.

Previous studies that have evaluated perceived patient outcomes on social media have done so through the isolation of terms via “hashtags.” Instagram, a popular social media application that allows users to post photos or videos with their social network, popularized “hashtags” to allow users to interact on specific topics or trends.^{1,11} “Hashtags,” are words or phrases preceded by a hash sign (#) that can be used to track other user commentary on a specific topic and allow for an expedited way to extract related posts and identify digital content on a specified topic.^{1,11} Therefore, Instagram’s ease of searchability has made it an ideal medium to conduct an analysis of a patient’s perceived outcome after a specified surgery.

This study was performed in order to evaluate Instagram posts involving spine fusion and their postoperative course. Spine fusion was chosen due to the increasing volume of spinal fusions occurring across the United States. From 2004 to 2015, there has been a 138% increase in the volume of lumbar fusions, with a 73% increase in rate, in patients over the age of 65.¹² Spinal fusions are also recognized as a costly procedure for healthcare systems.^{12,13} Therefore, evaluating patient perceived outcomes via social media presents an opportunity to enhance outcomes by understanding the concerns of spinal fusion patients post-operatively.

The purpose of this observational study is to investigate the content posted by patients who have undergone spine fusion and examine their perceived outcomes. The tone of each post was determined and was evaluated in relation to other reported surgical factors within the specific post. It was hypothesized that the majority of spine fusions would be overall positive due to what has been established by previous articles within the literature.¹⁴ It was also hypothesized that patients that suffered neurological injuries would perceive their outcome as negative, regardless of the medical status of their fusion.

Materials and Methods

A third party application (Picodash, San Francisco, CA) was used to search Instagram for relevant posts. Public Instagram posts that used “#spinefusion” and “#spinalfusion” were used for the study. Two reviewers (JMR and BMH) independently evaluated all posts. Given that posts were posted publicly, no ethical approval was necessary and no identifying information was extracted for the study. Prior to statistical analysis, all posts were agreed upon by the authors. Disagreement between reviewers was ultimately resolved through formal discussion with all other authors of the study.

Inclusion and Exclusion Criteria

264 posts were identified that met the original search criteria using #spinefusion and #spinalfusion. Personal accounts for physicians, health accounts, or accounts advertising for rehabilitation or therapy were excluded for the study. The following variables were assessed for each post: gender, tone, discussion of rehabilitation, activities of daily living (ADL) reference, incision/scar reference, pain, post of radiograph/imaging, traumatic injury, and subsequent neurologic deficit.

Statistical Analysis

Responses were summarized by frequency and percent. Data was entered into Microsoft Excel 2011 (Microsoft Corporation, Redmond, WA) and R statistical software (R Foundation for Statistical Computing, Vienna, Austria) was used for statistical analysis. Association between tone of posting and other factors was assessed by Chi-square analysis. Multivariate logistic regression model was used to assess tone of posting with the other variables extracted from the posts. P -value < 0.05 was considered statistically significant.

Results

Of the 264 posts reviewed, 85.20% were posted by females while the remaining 14.80% were posted by males. Posts that were positive in tone accounted for 85.98%. Negative posts made up the remaining 14.02%. A majority of posts mentioned activities of daily living within their social media post (68.20%). Pain was also frequently mentioned in posts (39.80%). Other surgically relevant commentary in the posts involved rehabilitation (29.20%), incisions/scar (8.70%), neurological deficits (8.70%), and inclusion of imaging studies (4.50%).

There was statistical significance between positive tone and ADLs ($P = 0.047$), as well as negative tone and pain ($P = 0.008$), with an odds ratio of 2.11 and 0.38, respectively (Table 1). Furthermore, there was statistical significance between negative tone and continued neurologic deficit ($P = .017$). There were no significant differences between gender and tone of the post. There was no statistical significance found between tone and the other factors: incision/scar, inclusion of imaging, and trauma (Table 2).

Discussion

Spinal fusion is a common procedure performed for a multitude of indications. From degenerative disease to instability, the indications for fusion continue to evolve as new techniques, technologies, and new outcome research continue to surface.¹⁵ Nonetheless, there remains some controversy regarding indications for spinal fusion in light of increasing rates of spinal fusion surgery occurring across medicine.^{14,16,17} Turner et al. performed a systematic review of the literature estimating that, on average, 68% of patients had a satisfactory outcome after fusion.¹⁴ A challenge of spinal fusion is that patients may

Table 1. Patient Characteristics.

	Total (N = 264)	Negative (N = 37)	Positive (N = 227)	P-value
Gender				0.202
F	225 (85.2%)	35	190	
M	39 (14.8%)	2	37	
Hashtag				0.230
#spinalfusion	124 (47.0%)	14	110	
#spinefusion	140 (53.0%)	23	117	
Rehab	77 (29.2%)	10	67	0.757
ADL	180 (68.2%)	20	160	0.047
Incision/Scar	23 (8.7%)	2	21	0.442
Timing	24 (9.1%)	3	21	0.823
Pain	105 (39.8%)	22	83	0.008
XR				0.416
	140 (53.0%)	23	117	
MRI	1 (0.4%)	0	1	
No	112 (42.4%)	14	98	
XR	11 (4.2%)	0	11	
Trauma/No Trauma				0.284
	2 (0.8%)	1	1	
No Trauma	246 (93.2%)	33	213	
Trauma	16 (6.1%)	3	13	
Neurological Deficit				0.017
Yes	23 (8.7%)	7	16	
No	241 (91.3%)	30	211	

Table 2. Significant Factors for Positive Tone in the Social Media Posting From Multivariable Logistic Regression Model.

Effect	OR (95% CI)
ADL	2.11 (1.01, 4.39)
Pain	0.38 (0.18, 0.78)

continue to have pain post-operatively and perceive their procedure negatively, regardless of the success of the fusion.^{14,18,19} Expectations may vary wildly between patients and, in order to maximize outcome, should be managed appropriately before and after spinal fusion.²⁰

Synonymous with the success of spinal fusion seen within the literature, the overall tone seen in this study was positive. Given the importance of recognizing “patient-centric” issues, it is imperative to investigate what the drivers are for patient perception as pertains to their surgical intervention. As social media continues to popularize and infiltrate the healthcare system, analysis of social media presents an opportunity for surgeons to utilize a different perspective to identify potential areas of improvement and to evaluate patients during the recovery process.

Our analysis revealed that there was a statistical significance between positive tone of a post and activities of daily living. ADLs were mentioned in 68.20% of posts signifying the importance of ADLs to patients within the recovery process. Additionally, relief of pain was associated with a positive tone of post. Pain was discussed in 39.80% of all posts and, expectedly, played a vital role in the patient’s perceived outcome of the surgery. Finally, statistical significance was found between a negative tone and a neurological deficit. No statistical significance was found between tone, rehabilitation, and incision/

scar. Of note, women comprised the large majority of posts, with 85.20% of posts within this cohort being posted by females. Even though females made significantly more posts compared to males, we do not think this has a substantial bearing on the overall patient perception of surgery. Given the frequency of posts including pain and ADLs, this may provide surgeons with some direction as to managing expectations and better understanding the concerns of their patients in order to improve patient perceived outcomes.

Interestingly, patients who utilized a positive tone, to exemplify their improved direction of recovery, utilized social media as an avenue to discuss their progress with friends and family. While this was not formally evaluated in this study, anecdotally, we recognized that multiple patients utilized their social media network for empowerment and support. On multiple occasions, families and friends would relay messages of support for spinal fusion patients—that were frequently well received by the patient as encouragement. Patients who frequently utilized #spinefusion and #spinalfusion within their posts began to interact with each other on a regular basis. This network of users would leave comments with words of encouragement and personal advice through the recovery process. These interactions with others who have underwent similar procedures, may be used as an asset for physicians in helping patients heal outside of the healthcare setting. The phenomenon of a patient network, through social media, reinforces the concept that the support of friends and family may play a critical role in the postoperative progress of patients after spinal fusion.²¹

This observational study has its limitations. Firstly, the subjective nature of evaluating posts is a limitation within itself. The tone of posts was not always easy to discern. When confronted with this predicament, the tone of posts was cumulatively decided between authors. This was felt to be the most reasonable and systematic approach to triaging this issue. The authors of this manuscript understand that there are differing degrees of negativity and positivity to surgical procedures as well as the posts analyzed within this study. However, for the sake of this investigation, we attempted to define posts as *overall* positive or negative. This was based on the patient’s clinical status and satisfaction, or lack thereof, within the post. Secondly, the use of social media populates a cohort with an inherent selection bias. Users of social media are generally younger, while patients undergoing spinal fusion are frequently greater than 65 years of age. Therefore, the demographic of patients utilizing social media may not be an accurate metric of the patients who routinely undergo this procedure. Users of social media oftentimes portray their lives with a positive tone on social media. Therefore, it is a plausible consideration that many of those not posting are not pleased with their progress, or potentially suffered a complication—one that they have chosen not to broadcast publically and remains private. This may cloud the patient perceived outcome after spinal fusion. Additionally, among these 264 spine fusions, there are different indications as well as length of the fusion construct. These fusions were not sub-categorized based on severity, prior

surgical indication, or length of surgical fusion, which is an additional limitation in the study. However, given the limited, or lack of radiographic images, it was not feasible to sub-categorize spine fusions accurately.

This study shows the overall trend that patient's posting on social media are portraying themselves in an overall positive light. While this may not be reflective of their overall clinical status, this does exemplify variables of care that are seen as important to the individual patient. More specifically, ADLs, relief of pain, and improvement in neurological symptoms appear to be areas of definite significance to patients who have suffered undergone a spine fusion. Due to these limitations, the authors recognize that, the content of social media users are not an accurate representative of the population at large, nevertheless, this article may serve as a starting point to see if meaningful information may be gleaned from social media users to improve care of patients who have undergone a spine fusion.

Conclusion

This analysis of patients sharing their experience of social media after spinal fusion demonstrates mostly positive attitude toward the procedure and its recovery. A positive tone was associated with ADLs, while a negative tone was associated with persistent pain and neurological deficits. Understanding which variables are important for patients after surgery may assist surgeons in managing expectations after spinal surgery and optimizing outcomes after spinal fusion.

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ORCID iD

James M. Rizkalla, MD  <https://orcid.org/0000-0003-2835-0371>

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