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Justifying Our Decisions About Surgical Technique: Evidence from Coaching Conversations

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Abstract

Background—The quality of an operation depends on operative technique. There is very little evidence, however, regarding how surgeons arrive at their intraoperative decisions. The objective of this study was to determine the extent to which practicing surgeons participating in a coaching program justify their technical decisions based on their experience or based on evidence.

Methods—This qualitative study evaluated 10 pairs of surgeons participating in a video review coaching program in October 2015. Using thematic analysis, the conversations were coded in an iterative process with comparative analysis to identify emerging themes.

Results—Three major themes emerged during analysis. (1) Individuals often reported modifications in surgical technique after a negative postoperative complication. (2) Participants were noted to defend the use of certain techniques or surgical decisions based on the perceived expert opinion of others. (3) Surgeons rarely referred to evidence in surgical literature as a motivation for changing surgical technique.

Conclusions—In this qualitative analysis of coaching conversations we found that practicing surgeons often justify their surgical decisions with anecdotal evidence and “lessons learned”, rather than deferring to surgical literature. This either represents a lack of evidence or poor uptake of existing data.

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Keywords

Evidence based medicine; surgical training; surgical education; coaching; video review

Introduction

A surgeon's educational foundation is largely based on their experiences during residency and fellowship training that most often follow an apprenticeship model. However, this approach to educating surgical trainees has been criticized for being vulnerable to experience-driven bias.[1] After completion of formal training, practicing surgeons are required to participate in Continuing Medical Education and more recently, surgeons have embraced innovative alternatives to improve their clinical skills and help fill the void created by this traditional approaches to surgical education.[2]

Whether or not structured coaching relationships for practicing surgeons can transcend the anecdotal teaching style of traditional surgical training is unclear. On the one hand, coaching environments are more structured and both participants are fully trained. This may promote a more evidence-based analysis of performance [3]; on the other hand, there is a strong tradition of experience-based teaching of surgical skill that may persist even in surgical coaching. Additionally, while there is an emphasis in evidence-based medicine when teaching perioperative management and pre-operative decision-making, surgical coaching focuses on very granular intra-operative details that may not have sufficient evidence on which to base operative decisions.

In this context, we sought to determine the extent to which coaching participants justify their approach to technical improvement on scientific evidence. We analyzed transcriptions of recorded coaching sessions from the largest surgical coaching program to date as part of the Michigan Bariatric Surgical Collaborative. Through the performance of a qualitative thematic analysis, we sought to understand the degree to which improvement plans derived from the coaching are based in surgical evidence versus anecdote or personal experience.

Methods

We sought to understand how practicing surgeons disseminate specific surgical techniques, and ultimately justify their intraoperative decision-making, in the context of surgical coaching sessions. This coaching intervention took place within the Michigan Bariatric Surgery Collaborative (MBSC). MBSC is a private payer initiative that includes all hospitals and surgeons engaged in bariatric surgery in the state of Michigan, with its primary aim focused on improved surgical quality in the field of metabolic disease.[4] Within MBSC, a coaching intervention was developed based on the Wisconsin Surgical Coaching Program. [5] The intervention involved periodic structured video review and feedback on key components of the laparoscopic bariatric procedure. Coaches were identified as the top 15 performing surgeons in the MBSC as judged by their risk-adjusted outcomes for the 2 years prior to this study. The outcomes considered in this analysis included surgical complications (e.g. surgical-site infection, anastomotic stricture, bowel obstruction, or bleeding) and medical complications (e.g. respiratory failure, renal failure, VTE, cardiac failure and

death). The correlation between surgical technique and postoperative outcomes has previously been demonstrated by this group.[4] Coaches received formal training in peer coaching which emphasized goal setting, guiding inquiry, giving feedback, and carrying forth an action plan. This training was delivered by an executive coach and was based on the Wisconsin Surgical Coaching Framework.[2]

Data collection

Data was collected during the first MBSC coaching session in October 2015. These sessions included a total of 20 practicing bariatric surgeons, with 10 assigned to the role of coach and 10 assigned to the role of coachee.

Our analysis included 10 transcripts between the 20 participants from the first formal coaching session discussing videos of laparoscopic bariatric procedures provided by the coachee. The coaches had received training on peer coaching principles, and were provided with a broad framework as well as tools to support the framework, but the content of the conversation was otherwise not directed so it can be tailored to the needs of the coachee. Each coaching exchange took place face-to-face and the focus was on videos of laparoscopic bariatric procedures that had been performed by the coachee. The session lasted approximately one hour.

The coaching exchanges were audiotaped, transcribed, and deidentified to preserve anonymity. Given the small number of participants and surgeons in MBSC, no demographic information was collected.

Analysis

This study employed a phenomenological approach to our inquiry of the basis for surgical technique and intraoperative decision-making. We used inductive reasoning in our qualitative data analysis to help identify themes. This entails identifying broad themes, that is to say codes, after reviewing a select number of transcripts then define more specific themes by dividing the broad themes into sub-topics or sub-themes.

Thematic analysis of the transcripts was undertaken by two authors (AK and SS). Initially, these authors separately conducted line-by-line coding on the first two transcripts. They then met to discuss preliminary codes and develop a codebook. The codebook was a collection of emerging themes that served as a structure for subsequent analysis. The codebook was trialed on two additional transcripts to confirm that the codes accurately reflect the participants' voices. Any newly identified themes were added to the codebook prior to analyzing all of the transcripts. The authors read each transcript independently and created analytic memos capturing early insights and interpretations.

The authors (AK and SS) met regularly to review patterns and reach coding consensus on the transcripts. The codebook was further amended as new themes developed, and the authors revisited earlier transcripts to identify additional thematic occurrences. This iterative process of refinement was performed to maintain consistency across all transcripts. An additional author (JD) was available to resolve any discrepancies that arose during the analysis.

NVivo 11 (QSR International Pty Ltd., 2017), qualitative research software, was used for data management. This study was approved by the University of Michigan Institutional Review Board.

Results

Three themes were identified through team consensus relating to the dissemination and justification of particular surgical techniques and intraoperative decision-making (Table).

1. **Reaction to Negative Outcome:** Participants reported modifications in surgical technique after a particularly negative postoperative complication for a single patient.
2. **Expert Opinion:** Participants were noted to defend the use of certain techniques or surgical decisions based on the perceived expert opinion of others.
3. **Limited Supporting Evidence:** Participants rarely referenced surgical literature or educational programming as the motivation for changing surgical technique.

Reaction to Negative Outcome

The most frequent justification provided by surgeons for a change in technique or surgical decision-making was their experience with an unexpected negative patient outcome. This was particularly true for highly morbid postoperative complications; such as hemorrhage or anastomotic leaks. If the surgeon was able to identify an intervention that they thought anecdotally decreased the likelihood of this complication, the change in technique was often adopted for subsequent patients, regardless of underlying risk of complication or the availability of supportive evidence.

For example:

“Coach: Why did this leak? I had no reason, I had no idea why it leaked and so that’s when I started to just say, ‘I’m just going to oversee everybody.’”

In some instances, the surgeon experienced an adverse event following a change in technique, and thus attributed the negative outcome with this change. As such, the previous technique was reintroduced into practice in order to avoid further complications.

For example:

“Coachee: Do you [place a drain]?”

Coach: I do just because one of my leaks. I had a bleed develop a hematoma and I was draining and I said, ‘why am I doing this?’ Well during that course when I took it out, one of my sleeves had a hematoma. Hematoma got infected and they got a leak.”

In some instances, the change in technique resulted from a single unexplained complication. In other settings, the surgeon reported multiple repeat adverse events that eventually resulted in the adoption of a new approach. Improvement in outcomes then reinforced this change and thus it becomes the standard of care.

For example:

“Coachee: The first couple sleeves I did, the first 15 or 20, I didn’t over-sew the staple line and I had a couple of people, probably four or five people develop significant bleeds. Clinically hypotensive, none of them had to go back to the OR... So I started over-sewing the staple line and then the bleeding stopped but it’s very time consuming.”

Expert Opinion

Individuals often referred to standard practice in their residency or fellowship training program or that of an expert in clinical practice as the basis for their technique or decision-making. As such, preferred techniques varied from surgeon to surgeon depending on exposures during training.

For example:

“Coachee: And that’s the thing. I really don’t know if it does anything of if it’s just another step that one can do without....

Coach: And you do it because that’s the way you learned?

Coachee: That’s the way I learned, yeah.

Coach: I don’t do it because that’s the way I learned.”

For example:

“Coachee: Like I said, I over sew the upper third of the sleeve, roughly. Coach: Okay. Always done it that way?

Coachee: Yes. Really, because like again, you know, the way I trained with – with – like I say, I pretty much adopted his style and so now I do it on every case.”

Participants also reported adoption of new techniques following their introduction in training courses sponsored by industry. The instructors were often identified as leaders of the field, and thus the participants regarded their suggestions as carrying similar weight to those introduced during their surgical training.

For example:

For example: “Coach: Do you ever place a Penrose or anything around the esophagus to help protect it?

Coachee: I do. Yeah, I do actually like that. I was doing a course once and a guy – I guess he was the ex-president of [De-identified] – he was like, ‘Why don’t you put a Penrose around that thing?’ I’m like, ‘Okay, I’ll do it.’”

Limited Supporting Evidence

A common finding throughout the coaching conversations was an overall lack of reference to evidence in describing their surgical approach. Surgeons referred to negative outcomes and anecdotes from mentors and training far more often in defending surgical decision-making than from published literature.

For example:

“Coachee: I’m just thinking about that, because I’m trying to defend using the short instruments and there really isn’t a good defense for it except for that’s the way I always do it.”

Occasionally, a participant would argue that the lack of available literature is a limitation in developing the optimal surgical approach.

For example:

“Coachee: I mean people do all kinds of different things on a sleeve, eventually we’ll find out what really works and what doesn’t, what makes a difference and what doesn’t.”

In some instances, surgical literature was referenced in support of the surgeon’s current technical approach as opposed to justification for a modification in technique.

For example:

“Coachee: Yeah, I don’t know, it’s funny because I’m so worried about the reflux and then a couple papers came out, one from Italy came out that suggested if you do a hernia repair aggressively, they don’t get reflux or you fix the reflux.”

Discussion

In this qualitative analysis of coaching conversations, we found that practicing surgeons most often justify their surgical decisions with anecdotal evidence and “lessons learned”, rather than using current surgical literature to motivate their behaviors. The participants in this early coaching experience most often identified prior knowledge gained from postoperative patient complications or their surgical training experiences to explain changes in technique or operative decisions.

Prior studies demonstrate that surgical training (e.g., residency and fellowship) predominantly relies on experience-based teaching. Surgical training has historically followed an apprenticeship model with trainees operating alongside attending surgeons in order to develop their technical repertoire.[6] Prior qualitative analyses have demonstrated that this highly valued approach has the potential to perpetuate surgical knowledge grounded in personal experience and the experiences of those more senior.[1] Surgeons tend to carry forward this approach to surgical education and must continue to reflect on their surgical practice in order to ensure ongoing professional development.[7] As such, the negative impact from unexpected complications carries a strong impact on future practice and seems to dominate the rationale expressed in coaching conversations to justify changes in technique.

Medical error resulting in significant change in practice is well documented across multiple specialties.[8–12] For example, following an complicated delivery resulting in litigation, obstetricians were found to increase their rates of cesarean section by 4% immediately following the event, and by 8% two years after the event.[10] This phenomenon is

sometimes referred to as the *I got burned once* (IGBO) principle, meaning that a single negative outcome becomes the guide for the future care of similar patients.[12, 13] While this can certainly result in improved outcomes for some, such as through improved communication between surgeon and anesthesia following an intraoperative hemorrhage, it is not necessarily an evidence driven change in clinical practice. Importantly, surgeons must always consider the basis for the practice change and whether it deviates from surgical evidence.

We believe there are two potential explanations for the lack of evidence presented during the coaching sessions: 1. Evidence exists but surgeons prefer to rely on anecdote; or 2. There is insufficient evidence to guide intra-operative decisions regarding granular aspects of surgical technique. We feel that the second explanation is more likely given that the surgeons in these coaching interactions often explicitly referenced a lack of evidence that substantiate best technical practices with a high degree of granularity. In addition, with the constantly evolving landscape of surgical research, it remains a challenge to identify high quality literature for incorporation into practice. This represents an important opportunity to develop and disseminate new methods for assessing surgical technique and intra-operative decision making. Our current methods for dissemination of evidence often fail. There is a large translational gap between what we know are best practices and adoption of these guidelines when they do exist. We feel that coaching may be an opportunity to help bridge this gap.

One emerging method for generating evidence on surgical technique is video analysis. Much of the current data on surgical technique is derived from operative reports. However, operative reports are limited in their ability to accurately capture the details of an operation as it cannot record the technical details with one hundred percent fidelity.[14] As such, there is a recent push towards incorporation of video documentation in review of technique as it provides a more objective assessment of the details of the operation, and may also help identify how the granular details of an operation may affect postoperative outcomes.[2, 4, 15] Video review with linkage to patient outcomes not only offers opportunity to identify best technical practices but also to help understand underlying cause of postoperative complications. In a study evaluating causes of common bile duct injuries authors performed a thorough review of 252 cases, and determined that technique was only to blame for 3% of injuries analyzed. Misidentification of structures and misperceived anomalous anatomy were more frequency the underlying causes of injury.[16] Similar root cause analyses through the use of video review could help identify the appropriate response to postoperative complications, and thus provide superior data driven technical guidance. This improvement in available best-practices would further strengthen the coaching exchange and ensure an evidence-based foundation for advice in technique.

There are limitations in this study that are worth noting. First, this analysis is based on 10 coaching sessions between participants from a single surgical subspecialty. As such, these findings may lack generalizability to other specialties outside of bariatric surgery. That said, there is little reason to believe there is more robust evidence guiding intra-operative technique for other surgical specialties. This weakness in the literature surrounding surgical technique likely characterizes the field of surgery as a whole. Additionally, this analysis is limited to the first interaction between individuals. Subsequent sessions may have provided

additional insight into rationale behind technical decision-making. Further work on this subject could include surgeons across multiple disciplines using a structured conversation tool to guide the discussion on evidence-based decision-making.

In this study we found that peer coaching sessions between practicing surgeons often focus on technique and intraoperative decisions guided by experience rather than evidence. This either represents a lack of evidence or poor uptake of existing data, and reinforces the need for more research and targeted interventions to identify and improve dissemination of best practices where they do exist. With the continued integration of video analysis and coaching feedback into surgical education, we will be able to strengthen the evidence surrounding surgical technique and ultimately improve patient outcomes.

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Table

Thematic analysis relating to the dissemination and justification of surgical techniques and intraoperative decision-making.

Theme	Definition	Quotes
Reaction to Negative Outcome	Modifications in surgical technique resulting from a negative postoperative complication.	<i>Coach: Why did this leak? I had no reason, I had no idea why it leaked and so that's when I started to just say, 'I'm just going to over sew everybody.'</i>
		<i>Coachee: Do you [place a drain]? Coach: I do just because one of my leaks. I had a bleed develop a hematoma and I was draining and I said, 'why am I doing this?' Well during that course when I took it out, one of my sleeves had a hematoma. Hematoma got infected and they got a leak</i>
		<i>Coachee: The first couple sleeves I did, the first 15 or 20, I didn't over-sew the staple line and I had a couple of people, probably four or five people develop significant bleeds. Clinically hypotensive, none of them had to go back to the OR...So I started over-sewing the staple line and then the bleeding stopped but it's very time consuming.</i>
Expert Opinion	Techniques or surgical decisions adopted from the perceived expert opinion of others.	<i>Coachee: And that's the thing. I really don't know if it does anything of if it's just another step that one can do without.... Coach: And you do it because that's the way you learned? Coachee: That's the way I learned, yeah. Coach: I don't do it because that's the way I learned.</i>
		<i>Coachee: Like I said, I over sew the upper third of the sleeve, roughly. Coach: Okay. Always done it that way? Coachee: Yes. Really, because like again, you know, the way I trained with – with – like I say, I pretty much adopted his style and so now I do it on every case.</i>
		<i>Coach: Do you ever place a Penrose or anything around the esophagus to help protect it? Coachee: I do. Yeah, I do actually like that. I was doing a course once and a guy – I guess he was the ex-president of [De-identified - company] – he was like, 'Why don't you put a Penrose around that thing?' I'm like, 'Okay, I'll do it.</i>
Limited Supporting Evidence	Limited references to surgical literature or educational programming as the motivation for changing surgical technique.	<i>Coachee: I'm just thinking about that, because I'm trying to defend using the short instruments and there really isn't a good defense for it except for that's the way I always do it.</i>
		<i>Coachee: I mean people do all kinds of different things on a sleeve, eventually we'll find out what really works and what doesn't, what makes a difference and what doesn't.</i>
		<i>Coachee: Yeah, I don't know, it's funny because I'm so worried about the reflux and then a couple papers came out, one from Italy came out that suggested if you do a hernia repair aggressively, they don't get reflux or you fix the reflux."</i>