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Patient expectations and decisional regret in the management of ventral hernias

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Abstract

Introduction Older adult patients have many factors to contemplate when considering elective ventral hernia repair. In this study, we aimed to understand whether our novel shared decision-making (SDM) aid helped reduce this population's decisional regret when choosing hernia management strategy.

Methods Patients ≥ 60 years of age presenting for ventral hernia evaluation were randomized to two groups. The experimental group had their visit guided by our novel SDM aid. All patients took a survey prior to consultation outlining their treatment expectations. All patients were called within 6 months to complete the Decision Regret Scale, which measures remorse after a healthcare decision.

Results Seventy-two patients (36 control, 36 experimental) completed final follow-up. On initial expectations evaluation, 53 patients (74%) reported wanting surgical repair and 58 patients (81%) reported expecting surgical repair. Ultimately, 18 patients in the control group and 17 patients in the experimental group did not undergo surgery. The use of the SDM aid did not affect if patients chose observation (OR 0.44, $p = 0.24$) or result in a lower decision regret score (9.86 vs 9.31, $p = 0.89$). Surgery was associated with a lower decision regret score (3.38 vs 16.14; $p = 0.001$). Of those who did not undergo repair, patients initially wanting or expecting surgery had higher decision regret scores (22.83 vs 3.33, $p < 0.001$; 20.40 vs 5.50, $p = 0.009$). Nonoperative patients who chose observation had less regret than those needing medical optimization (9.50 vs 25.00, $p = 0.04$). There were no differences in decision regret scores based on initial wants or expectations for those who had surgical repair.

Conclusion Decisional regret following ventral hernia management is associated with patients' expectations prior to initial surgical consultation. The use of a decisional aid did not lower decision regret scores. These findings emphasize the need for upfront expectation setting and longitudinal programs to help patients reach their treatment goals.

Keywords Ventral hernia · Shared decision-making · Geriatric · Decision regret

Ventral hernias are very common, with over 600,000 ventral hernia repairs performed annually in the United States [1].

Older adults are presenting for ventral hernia evaluation at increasing rates. This is due to several reasons, one being that there are an increasing number of older adults in the population. The population of adults aged at least 65 years is expected to double to 88 million by the year 2050 [2]. Additionally, older adults have several factors that put them at higher risk of hernia formation, including weakened abdominal wall musculature and higher rates of comorbidities that increase intra-abdominal pressure, such as benign prostatic hypertrophy and constipation [3–6]. Concurrently, older adults have age-related risk factors that put them at higher risk if they do pursue surgical repair, such as multimorbidity, frailty, and cognitive impairment [4, 7, 8]. Given the largely elective nature of ventral hernia repair, it can

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be challenging to determine which older patients should undergo an operation.

Shared decision-making (SDM) is a collaborative process between a provider, a patient, and their family that allows all parties to fully consider the risks and benefits of all treatment options, including no intervention, with an emphasis on how these options fit within each individual's value system and personal preferences [9]. Decisional aids are often used to assist with these conversations by providing information about relevant treatment options, describing possible outcomes and uncertainties for each choice, and clarify how personal values fit into these options while simultaneously communicating these preferences to practitioners [10, 11]. The use of such aids have been found to improve quality of decision-making, increase retention of knowledge, and decrease decisional conflict [10–13]. Given the aforementioned challenges in surgical decision-making in the older ventral hernia repair population, this population is ideal for SDM.

In this study, our group developed a novel SDM aid to assist in operative decision-making in patients aged 60 years or more presenting for evaluation of a ventral hernia. Patients were surveyed on their expectations prior to surgery and their decisional conflict following treatment decision (surgery vs observation). We hypothesized that the use of an SDM aid would reduce decisional regret in this population.

Methods

Using the validated SHARE approach, our team developed a decisional aid to assist with SDM, which we have previously described [14]. Patients aged 60 years or older who presented to our specialty hernia clinic at a quaternary medical center for evaluation of a ventral hernia were eligible for participation. Exclusion criteria included a prior diagnosis of cognitive impairment. If a patient agreed to participate, then they were randomized into one of two groups. Those in the control arm had a standard consultation with their surgeon, while those in the experimental group had their visit guided with our novel SDM aid.

All patients were given surveys regarding their expectations, decisional regret, and decision-making preferences regardless of group randomization. Survey time points included day of initial consultation and at a follow-up interval. If patients did not undergo surgical repair, they were called by a member of the study team 3–6 months after their consultation. If patients did have surgical repair, they were called 3–6 months after their procedure.

Prior to seeing the surgeon on the day of initial consultation, all patients were given an expectations survey. This was created by our study team to get an understanding of what patients expected from their appointment. Each statement on this 6-item survey was scored on a 5-item Likert scale. For data analysis, answers of "Agree" or "Strongly Agree" were grouped together as a positive response. The 6 statements are as follows: 1. I have a clear understanding why I am here today; 2. The referring doctor told me why I needed to see the surgeon; 3. I was told by the referring doctor that I will be having surgery; 4. I want to have surgery to repair my hernia; 5. I expect to have surgery to repair my hernia; and 6. I will be disappointed if I do not have surgery.

Patients were also assessed with the Control Preference Scale, of which the first component was completed at their initial consultation. This validated scoring system determines patients' preferred decision-making role [15]. Patients pick one of the following options: 1. I prefer to make the final selection about which treatment I will receive; 2. I prefer to make the final selection of my treatment after seriously considering my doctor's opinion; 3. I prefer that my doctor and I share the responsibility for deciding which treatment is best for me; 4. I prefer that my doctor makes the final decision about which treatment will be used but seriously considers my opinion; or 5. I prefer to leave all decisions regarding my treatment to my doctor. This same scale was asked 3–6 months following their treatment (either from the initial clinic visit or surgery date pending on treatment choice), to indicate the roles they experienced during decision-making for surgery. Patients were not reminded of their previous answer at the time of the follow-up survey.

Additionally, at this same follow-up phone call, patients were asked the validated Decision Regret Scale to determine the amount of regret they had about their treatment decision [16]. This scale consists of five statements: 1. It was the right decision; 2. I regret the choice that was made; 3. I would go for the same choice if I had to do it again; 4. The choice did me a lot of harm; and 5. The decision was a wise one. The items are scored on a 5-point Likert scale, with statements 2 and 4 being reverse coded. This value is then converted to a linear score from 0 to 100 with higher scores indicating more regret.

This study was approved by our institution's Institutional Review Board. Data were collected via RedCap (RedCap v9.5.5, 2020, Vanderbilt University) and analyzed using Microsoft Excel (Microsoft, Redmond, WA, USA). Chi-squared tests were applied for analysis of categorical variables and independent *t* tests were applied for continuous variables. p values of < 0.05 were considered significant.

Results

Seventy-five patients were enrolled in the study; however, only 72 patients completed final follow-up and were included in the analysis (36 control, 36 experimental). There were no differences in demographics, including age, gender, body

mass index (BMI), comorbidities, Charlson Comorbidity Index (CCI), education level, or hernia recurrence (Table 1).

On expectation survey, the majority of patients ($n=53$, 73.6%) stated that they wanted surgery, as indicated by marking "Agree" or "Strongly Agree" on their expectations survey (Table 2). The majority of patients also expected to have surgery ($n=58$, 80.1%). However, only 41 patients (56.9%) stated that they would be disappointed if they did not have hernia surgery. Most patients reported they understood why they were seeing the surgeon in clinic ($n=67$, 93.1%). Notably, 31 patients (43.1%), were told by their referring doctor that they would be having surgery. While the majority of patients either both wanted and expected surgery ($n=50$, 69.4%) or neither wanted nor expected surgery ($n=11$, 15.3%), there was a cohort that had discordant responses (Table 3). Eight patients (11.1%) reported that they did not want surgery, but did expect to undergo surgery, and 3 patients (4.2%) reported that they wanted surgery but did not expect to have their hernia repaired.

Table 1 Patient demographics. p values < 0.05 were considered significant

	Control (n = 36)	Experimental (n = 36)	p value
Age, average (range)	69.2 (60–85)	69.9 (61–83)	0.62
Sex—male, n (%)	15 (41.7%)	15 (41.7%)	1.00
Race, n (%)			1.00
White	33 (91.7%)	33 (91.7%)	
Black	3 (8.3%)	3 (8.3%)	
BMI, average (range)	33.5 (22.8–54.4)	32.68 (18.4–44.1)	0.63
Education Level, n (%)			0.17
High School Graduate	14 (38.9%)	9 (25.0%)	
Some College	11 (30.6%)	13 (36.1%)	
Graduated College	6 (16.7%)	2 (5.6%)	
Some Graduate School	2 (5.6%)	3 (8.3%)	
Graduate School Graduate	3 (8.3%)	9 (25.0%)	
Comorbidities, n (%)			
Hypertension	27 (75.0%)	23 (63.9%)	0.31
Diabetes Mellitus	5 (13.9%)	8 (22.2%)	0.36
Obstructive Sleep Apnea	4 (11.1%)	8 (22.2%)	0.21
COPD	4 (11.1%)	3 (8.3%)	0.69
Prior Heart Attack/PCI	7 (19.4%)	5 (13.9%)	0.53
Congestive Heart Failure	2 (5.6%)	4 (11.1%)	0.39
Cerebrovascular Disease	2 (5.6%)	1 (2.8%)	0.56
Cancer History (non-skin)	11 (30.6%)	12 (33.3%)	0.80
CCI, average (range)	3.44 (2–10)	3.97 (2–9)	0.16
Smoking Status, n (%)			0.08
Non-Smoker	19 (52.8%)	16 (44.4%)	
Former Smoker	13 (36.1%)	15 (41.7%)	
Current Smoker	4 (11.1%)	5 (13.9%)	
History SSI, n (%)	7 (19.4%)	10 (27.8%)	0.41
Recurrent Hernia, n (%)	21 (58.3%)	14 (38.9%)	0.10

Age (years); *BMI* body mass index (kg/m^2); *COPD* chronic obstructive pulmonary disease; *PCI* percutaneous coronary intervention; *CCI* Charlson Comorbidity Index; *SSI* surgical site infection

Ultimately, 18 people in the control group and 17 people in the experimental group did not undergo surgical repair (Fig. 1). In the control group, 12 patients opted for observation and 6 patients needed further medical optimization to be considered fit for surgery. Medical optimization included weight loss, smoking cessation, or optimization of a medical comorbidity. In the experimental group, 8 patients chose observation and 9 patients did not have surgical repair due to need further medical optimization. The use of the SDM aid did not affect if patients chose observation (OR 0.44, 95% CI [0.57–8.82], $p=0.24$). Nine patients (15.5%) chose observation after initially stating they wanted surgery, as compared to 11 patients (78.5%) who chose observation after initially stating they did not want surgery. Table 3 demonstrates how many people underwent surgical repair based upon initial wants and expectations.

Decision regret scores were analyzed (Table 4). The use of the SDM aid did not result in a lower decision regret score (9.86 vs 9.31, $p=0.89$). However, having surgical repair was associated with less regret (3.38 vs 16.14; $p=0.001$). This relationship held true when comparing within the groups (control: 4.44 vs 14.17, $p=0.03$; experimental: 2.37 vs 18.24, $p=0.02$). Those nonoperative patients who chose observation ($n=20$) had lower decision regret scores than those who did not have surgery due to need for medical optimization (9.50 vs 25.00, $p=0.04$). Interestingly, when breaking it up by participant group, this same trend was seen in the experimental group (5.00 vs 30.00, $p=0.04$), but not in the control group (12.50 vs 17.50, $p=0.57$).

Patients who initially reported wanting or expecting surgery but did not have a repair reported higher decision regret scores (22.83 vs 3.33, $p<0.001$; 20.40 vs 5.50, $p=0.009$, Table 3). When looking within each nonoperative group, wanting surgery was still significantly associated with higher decision regret scores (control: 18.46 vs 3.00, $p=0.009$; experimental: 28.50 vs 3.57, $p=0.03$). Of those who chose observation, there were significant differences in decision regret score based on if the patient initially wanted surgery (16.7 vs 3.63, $p=0.049$) and or expected surgery (14.58 vs 1.88, $p=0.01$). Patients who reported that they would be disappointed if they did not have surgery also had higher regret

Table 2 Patient expectation survey. All values reported as n (%)

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
I have a clear understanding why I am here today	51 (70.8%)	16 (22.2%)	2 (2.8%)	0 (0.0%)	3 (4.2%)
The referring doctor told me why I needed to see the surgeon	44 (61.1%)	17 (23.6%)	5 (6.9%)	4 (5.6%)	2 (2.8%)
I was told by the referring doctor that I will be having surgery	15 (20.8%)	16 (22.2%)	22 (30.6%)	10 (13.9%)	9 (12.5%)
I want to have surgery to repair my hernia	37 (51.4%)	16 (22.2%)	12 (16.7%)	3 (4.2%)	4 (5.6%)
I expect to have surgery to repair my hernia	34 (47.2%)	24 (33.3%)	11 (15.3%)	0 (0.0%)	3 (4.2%)
I will be disappointed if I do not have hernia surgery	25 (34.7%)	16 (22.2%)	16 (22.2%)	5 (6.9%)	10 (13.9%)

Table 3 Wants and expectations of patients presenting for ventral hernia repair. Values reported as n (%). Also noted is percentage of each group that underwent surgical repair

	Did Not Want Surgery	Wanted Surgery
Did Not Expect Surgery	11 (15.3%) (27.3% had surgery)	3 (4.2%) (66.7% had surgery)
Expected Surgery	8 (11.1%) (40.0% had surgery)	50 (69.4%) (56.0% had surgery)

scores when they did not undergo surgical repair (22.89 vs 2.73, $p=0.002$).

Of patients who underwent surgical repair, there were no differences in decision regret scores based on initial wants or expectations of surgery (2.33 vs 7.86, $p=0.11$; 3.64 vs 1.25, $p=0.20$, Table 3). Additionally, a postoperative complication did not result in higher decision regret scores (6.07 vs 2.00, $p=0.12$). In total, 14 patients had a postoperative complication, including 6 in-hospital complications, 5 surgical site occurrences, and 4 readmission within 30 days (some patients had more than one complication). In-hospital complications included 3 cases of postoperative ileus, 2 cases of cardiac arrhythmia requiring medical intervention, and 1 case of pneumonia. Differences in regret scores were more prominent in the experimental group who had a complication (10.00 vs 0.35), however, was not significant ($p=0.07$).

The majority of patients reported that they prefer shared responsibility for making healthcare decisions with their doctor ($n=33/72$, 45.8%) or that they prefer to make the final decision after seriously considering their doctor's opinion ($n=24/72$, 33.3%, Fig. 2). During follow-up, patients were asked how their treatment decision was made, and this was categorized as having the same amount of participation in their decision-making relationship with their doctor as preferred, having more autonomy in their decision, or having less autonomy in their decision than originally preferred. There was not a difference in patient preferences compared to actual practice based on use of the SDM aid ($p=0.13$).

Discussion

In our specialized hernia center, the use of a decision aid did not lower decisional regret in older adult ventral hernia patients. However, we found that patient expectations prior to initial surgical consultation were associated with decisional regret. Those patients managed non-operatively who reported they wanted and expected surgical repair had higher decisional regret scores. Interestingly, the inverse was

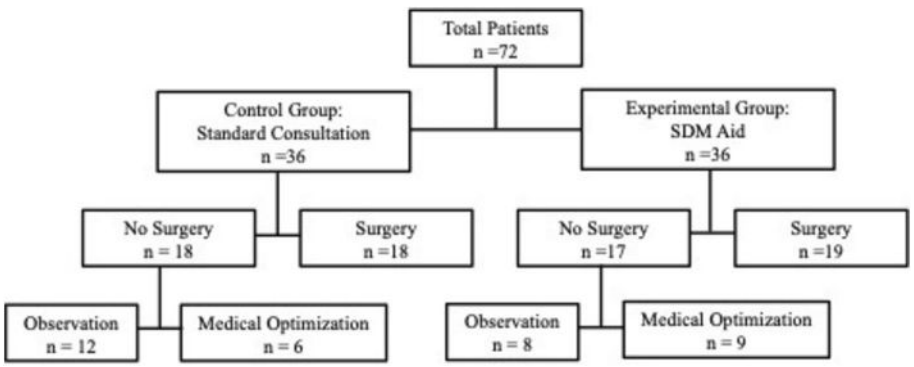

Fig. 1 Patient treatment decisions

Table 4 Decision regret scores. Reported 3–6 months following treatment choice for ventral hernia

	Comparison Group 1 average [range] (n)	Comparison Group 2 average [range] (n)	p value
SDM Aid			
	Control	Experimental	0.89
	9.31 [0–50] (36)	9.86 [0–100] (36)	
Treatment Choice			
	No Surgery	Surgical Repair	
All	16.14 [0–100] (35)	3.38 [0–25] (37)	0.001
Control	14.17 [0–50] (18)	4.44 [0–25] (18)	0.03
Experimental	18.24 [0–100] (17)	2.37 [0–20] (19)	0.02
No Surgery			
	Observation	Medical Optimization	
All	9.50 [0–50] (20)	25.00 [0–100] (15)	0.04
Control	12.50 [0–50] (12)	17.50 [0–50] (6)	0.57
Experimental	5.00 [0–15] (8)	30.00 [0–100] (9)	0.04
	Did Not Want Surgery	Wanted Surgery	
All	3.33 [0–15] (12)	22.83 [0–100] (23)	< 0.001
Control	3.00 [0–10] (5)	18.46 [0–50] (13)	0.009
Experimental	3.57 [0–15] (7)	28.50 [0–100] (10)	0.03
	Did Not Expect Surgery	Expected Surgery	
All	5.50 [0–30] (10)	20.40 [0–100] (25)	0.009
Control	5.00 [0–10] (3)	16.00 [0–50] (15)	0.057
Experimental	5.71 [0–30] (7)	27.00 [0–100] (10)	0.06
No Surgery—Chose Observation			
	Did Not Want Surgery	Wanted Surgery	
All	3.63 [0–15] (11)	16.70 [0–50] (9)	0.049
Control	3.75 [0–10] (4)	16.88 [0–50] (8)	0.08
Experimental	3.57 [0–15] (7)	15 [15] (1)	N/A
	Did Not Expect Surgery	Expected Surgery	
All	1.88 [0–10] (8)	14.58 [0–50] (12)	0.01
Control	2.50 [0–5] (2)	14.50 [0–50] (10)	0.07
Experimental	1.67 [0–10] (6)	15.00 [15] (2)	< 0.001
Surgery			
	Did Not Want Surgery	Wanted Surgery	
All	7.86 [0–20] (7)	2.33 [0–25] (30)	0.11
Control	11.25 [0–20] (4)	2.50 [0–25] (14)	0.13
Experimental	3.33 [0–5] (3)	2.19 [0–20] (16)	0.62
	Did Not Expect Surgery	Expected Surgery	
All	1.25 [0–5] (4)	3.64 [0–25] (33)	0.20
Control	0.00 [0] (1)	4.71 [0–25] (17)	N/A
Experimental	1.67 [0–5] (3)	2.50 [0–20] (16)	0.71
	No Postoperative Complication	Postoperative Complication	
All	2.00 [0–20] (20)	6.07 [0–25] (14)	0.12
Control	5.83 [0–20] (6)	4.50 [0–25] (10)	0.77
Experimental	0.35 [0–5] (14)	10.00 [5–20] (4)	0.07

Significant p values bolded ($p < 0.05$)

SDM shared decision-making

not true, with those patients managed surgically who denied wanting or expecting surgery having the same regret scores as the patients who did have initial desire for surgery. The highest decision regret scores were seen in patients in the experimental group who did not undergo surgery due to need for medical optimization.

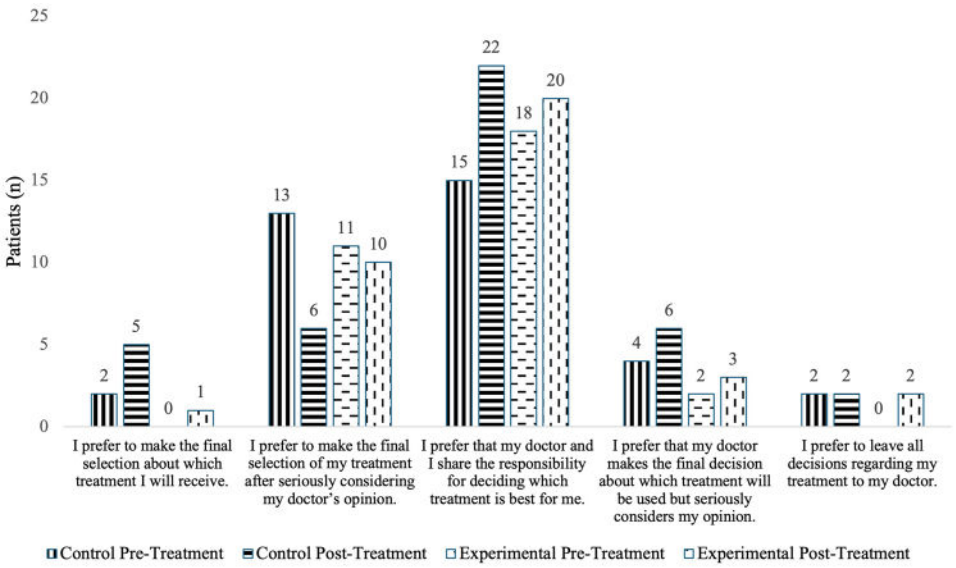

Fig. 2 Pre- and post-treatment responses to Control Preference Scale. Striped columns represent the control group and dashed columns represent the experimental group

Prior studies have shown that decision aids increase knowledge retention and decrease decisional conflict, although data on effects on decisional regret are conflicting. Multiple studies have shown that decisional conflict was not reduced by the use of a SDM aid [16–18]. In this study, we did not find that the use of an aid reduced decisional regret. Although use of the aid did not have significant effect on rates of treatment choices, we found that those who did not undergo surgery had higher decision regret scores in both participant groups. Interestingly, we saw that patients who did not have surgery in order to undergo medical optimization had higher regret scores when using the decision aid, but not in the control group. This could be due to patients feeling a greater sense of responsibility for making the decision not to have surgery, whereas the patients in the control group may have felt that the decision was made by their surgeon. Studies have shown that patients do not necessarily feel more empowered when given more decision-making responsibility depending on their preferences [19]. Studies have also shown that patients feel more depressed after making decisions with the use of a decision aid, even when the treatment decisions were the same as the control group [20]. It is important to recognize that decision-making preferences and feelings of responsibility vary among patients when taking part in SDM conversations.

Unsurprisingly, the majority of patients presenting to a surgical clinic reported wanting or expecting surgical repair of their ventral hernia. Studies across various specialties have found that patients are seeking a sense of returning to baseline when seeking surgical treatment, and this can sometime be at odds with surgeon expectations. For example, patients expect improvement in their psychosocial well-being and a feeling of "normalcy" following bariatric surgery, while providers focus on reduction of comorbidities and absolute weight loss [21–23]. These differences in expected outcomes can lead to unrealistic weight loss goals and subsequent patient dissatisfaction and decision regret. This desire for normalcy has also been found to be a large motivator for women undergoing surgery for uterine prolapse [24]. Despite some persistent physical symptoms, women labeled the operation successful if they were more independent afterward and felt a new "sense of self." Showing detailed postoperative images during preoperative counseling resulted in higher patient satisfaction and less distress following oncologic surgery for breast and skin cancers [25, 26]. Fully understanding and managing patient expectations and goals is crucial to improving patient satisfaction and can help providers adjust benchmarks for a successful outcome.

Literature has shown that a patient's informed decision is based on the ability to accurately predict the effectiveness and recovery process of a procedure; however, many patients have inaccurate perceptions of both their disease and surgical treatment [27]. Additionally, patient perceptions about their illness and assumptions about illness timeline and consequences are predictive of behaviors, potentially leading to illness relapses when these assumptions are not met [28]. Despite the use of a decision aid in our study, patients still regretted the decision to not have surgery, even when patient and surgeon have agreed that medical optimization would result in a better surgical outcome at a future time. So how do providers manage expectations for these patients? There is evidence in the rehabilitation literature that a formal goal setting process is essential for motivating the patient, allowing timely changes to ineffective activities, and establishing realistic goals that all team members can work toward [29]. Of note, many of the patients in our study stated that they were told by their referring provider that they would be having surgery. This complicates the picture further by having

another medical professional contributing to expectation setting, which can be unrealistic in some circumstances. These misconceptions can lead to patient confusion and erode trust in the patient–physician relationship [19, 27]. Trust in the physician has been found to be a strong factor in decreasing decision regret, even in the setting of a postoperative complication, and that trust alone results in perception of a shared decision and subsequently less decision regret [30, 31]. Integration of goal setting into decisional aids may lead to improved patient education, setting of realistic and agreed upon expectations, and ultimately less regret in this group.

We focused on the older ventral hernia patient given the unique risk factors that go into surgical risk stratification in this population. It has been suggested that the older adult surgical population is managed differently due to age alone [8]. While age is a risk factor, there have been studies that show age alone should not be considered when determining surgical candidacy [5, 32]. However, providers should be cognizant of how age can contribute to decision-making. Older adults undergoing treatment for basal cell carcinoma had more decisional conflict than younger patients, with the authors suggesting this may be due to this patient group feeling overwhelmed by information and preferring a paternalistic medicine model [33]. Additional studies have shown that younger patients tend to have higher preoperative expectations than their older counterparts [34, 35]. While the minority of our patients reported a preference for physicians making the final decision in their treatment, this potential generational difference in preferences and expectations may influence how the older adult population participates in SDM.

This study has several notable limitations. Firstly, this study was conducted at a single quaternary medical center that specializes in hernia care. The physicians involved are fellowship trained abdominal wall surgeons who frequently have complex hernia discussions with patients. While the decision aid did not affect decisional regret as compared to a standard consultation in our study population, these results may not be generalizable to other general surgery practices who do not provide such specialized care. Additionally, the study location may have biased results, as patients who would have been content with nonoperative management may be less likely to present for surgical consultation. Secondly, our study population was small and therefore, differences in the data may exist that we could not detect due to sample size. This may be particularly true in the setting of a postoperative complication, as the numbers of notable events were low in this study, although data are mixed whether postoperative complication is associated with an increase in decision regret [36–39]. Lastly, we were specifically interested in looking at the older adult population due to their unique surgical risk factors and therefore, we cannot comment on how a younger population of ventral hernia patients may be affected by the use of an SDM aid. Additionally, there may be other intangible life experiences that older patients have accumulated over their lifetime that affect their surgical decisions, such as prior operative interventions, that are not accounted for in this study.

Conclusion

Decisional regret following ventral hernia management in the older adult population is associated with patients' expectations prior to initial surgical consultation. The use of a decisional aid did not lower decision regret scores. Overall, surgical repair resulted in less decisional regret, even if a postoperative complication occurred. These findings emphasize the need for up front education and expectation setting, by both surgeons and referring physicians, as well as the need for longitudinal programs to help patients reach their treatment goals.

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Declarations

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