## Factors associated with decisional regret among patients undergoing major thoracic and abdominal operations

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**Background.** No study has specifically investigated patient attitudes on decisional regret concerning major operative procedures. The objective of the present study was to define the prevalence of regret among patients who had undergone a major abdominal or thoracic operative procedure and to identify factors associated with postoperative regret.

**Methods.** Decisional regret was assessed using the validated Decision Regret Scale, which consisted of 5 items with Likert-scale responses. Data on preoperative decision-making preferences and postoperative regret, quality of life, and symptoms of anxiety and depression were collected and analyzed.

**Results.** Overall, 157 (68.9%) patients agreed to participate and completed the survey, while 12 (5.3%) patients declined citing lack of time or interest. The types of operative procedures varied, with 65 (41.7%) patients undergoing a thoracic operation, 59 (37.8%) resection of the pancreas, liver or bile duct, and 32 (20.5%) patients having a colorectal/enteric operation. Although most patients (n = 98, 62.4%) expressed no degree of regret, a subset of patients did; specifically, 59 (37.6%) patients conveyed a varied degree of postoperative regret, with 20 (12.7%) patients expressing a moderate degree of regret, and 13 patients (8.3%) experiencing substantial regret. Postoperative regret was associated with a history of postoperative complications (odds ratio 4.7, 95% confidence interval 1.2–17.7, P < .01) and with discordance between a patient's preferred and actual perceived decision-making role (odds ratio 5.3, 95% confidence interval 1.6–17.4, P < .01). Patients experiencing regret were 5 times more likely than patients not experiencing regret to demonstrate borderline or abnormal depression scores (odds ratio 5.4, 95% confidence interval 1.6–18.0, P < .01); anxiety scores directly correlated with regret (rho 0.254, P < .01).

**Conclusion.** Patient-reported decisional regret after major abdominal and thoracic operations was present in 37% of patients, with roughly 1 in 12 patients reporting substantial regret and distress over the decision to have undergone operation. Discordance between patients' preferred and actual involvement in operative decision-making was associated with postoperative regret, as was poor quality of life, anxiety, and depression. (Surgery 2016;  $\blacksquare$ :  $\blacksquare$ - $\blacksquare$ .)

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A PATIENT'S DECISION to undergo a major operation is complex. Ideally, a sufficient understanding of the potential risks and benefits of the intervention in

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The authors report no proprietary or commercial interest in any product mentioned or concept discussed in this article. This relation to the patient's values and goals of care should inform this choice. Unfortunately, patients sometimes can experience decisional regret after

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operations, a highly negative, situation-specific feeling that the outcome would have been better had the patient made a different decision.<sup>1</sup> In addition to being a highly negative emotion, regret also has been associated with lack of personal satisfaction, displeasure with providers, and even depression.<sup>2,3</sup> Early empirical studies of regret also have suggested that anticipation and avoidance of regret is a powerful motivator in decision-making.<sup>4-6</sup> As such, the concept of regret is important in understanding patient-centered choices as related to surgery.

Shared decision-making is well established as the best practice for increasing patient satisfaction and goal-directed care.<sup>7</sup> In turn, how actively a patient participates in the preoperative decision making process can affect future decisional regret.<sup>7-9</sup> Postoperative factors such as complications, recurrence of disease, and quality-of-life also may be correlated with decisional regret, but these factors have not been well studied.<sup>10-13</sup> Given the increased emphasis on patient centered outcomes, the topic of regret in medical and operative decision-making is increasingly important. Despite this, few reports have examined the concept of regret in the operative setting. In fact, the few studies that involved operative patients examined decisional regret related to the choice of 2 different therapeutic options with relative equipoise (eg, breast-sparing versus nonbreast-sparing operative options).<sup>14-18</sup> In contrast, to date, no study specifically has investigated patient attitudes on decisional regret around major operative procedures. Therefore, the objective of the present study was to define the prevalence of regret among patients who have undergone a major abdominal or thoracic operative procedure. In addition, we used a cross-sectional survey approach to examine the relationship of postoperative regret with preoperative and postoperative factors among these patients.

## METHODS

**Survey instrument design and administration.** Decisional regret was assessed using the validated Decision Regret Scale.<sup>7</sup> As previously reported, the tool consisted of 5 items with Likert-scale responses that were transformed into a total score of 0–100, with greater scores associated with greater regret.<sup>7</sup> The decision-making roles of the patient and provider were assessed using the Control Preferences Scale, a validated 5-point scale that ascertains the degree of involvement in medical decision-making.<sup>7</sup> General and disease-specific quality-of-life (QOL) were assessed using the Functional Assessment of Cancer Therapy–General Population and diseasespecific questionnaires, which have been validated in multiple cancer populations.<sup>7,19-23</sup> Patient anxiety and depression levels were measured by the Hospital Anxiety and Depression Scale, which has been validated to assess anxiety and depression reliably independent of physical symptoms; 14 questions are used to generate domain scores ranging from 0-21.<sup>24</sup>

The final survey (Supplemental Material) also collected information about sex, race, ethnicity, education, religion, and income. Clinical data were abstracted from the electronic medical record and included index diagnosis, details of the operative procedure, operation date, number of operative appointments prior to the index operation, and the occurrence of postoperative complications. Complications were graded using the Clavien-Dindo classification system; major complications were defined as grade III or greater.<sup>25</sup>

Eligible patients were aged 18 years or older and had undergone major abdominal or thoracic operations. Consecutive eligible participants were recruited from outpatient operative clinics at Johns Hopkins Hospital. No compensation was provided for participation. Study data were collected in a REDCap electronic data capture tool hosted at Johns Hopkins Hospital.<sup>26</sup> The study protocol was approved by the Johns Hopkins Medicine Institutional Review Board.

Statistical analysis. As appropriate, responses were recorded as ordinal (eg, Likert scale) or continuous data. Continuous variables were reported as medians with interquartile range (IQR) and compared using Spearman's correlation and Wilcoxon rank-sum tests. Categorical variables were compared using Pearson's  $\chi^2$  test. Logistic regression was utilized to analyze factors associated with regret. For the purposes of analyses, a regret score of 25 was used as the cut-off score for the presence of decisional regret. This value represented the highest possible subscore on at least 1 question and/or was associated with more than minimum scores on all 5 questions in the metric and has been used as a consensus cut-off in previous studies on regret.<sup>27-34</sup> As previously described, scores of 0-7 on the Hospital Anxiety and Depression Scale were used to indicate no significant anxiety/depression, 8-10 borderline anxiety/ depression, and >10 significant anxiety/depression.<sup>24</sup> Point estimates were reported as odds ratios (OR) with 95% confidence intervals (95% CI). Analyses were performed with Stata/MP 12 for Windows (StataCorp LP, College Station, TX).

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