

## Commentary Regarding “Abdominal Wall Reconstruction and Patient Comorbidities”

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We read with great interest the editorial “Abdominal Wall Reconstruction and Patient Comorbidities” by Dr Lineaweaver.<sup>1</sup> A discussion of risk factors for complications in complex abdominal wall reconstruction is a very important endeavor, as addressing those risk factors can result in true improvements in patient outcomes.

A discussion of complications in abdominal wall reconstruction is best approached by dividing complications into surgical-site occurrences (SSOs; including seroma, hematoma, dehiscence, skin necrosis, and delayed healing) on the one hand and hernia recurrence on the other. Most of the published literature agrees that patient comorbidities significantly increase the risk of SSOs. In a prospective study of 299 patients, Kanters et al<sup>2</sup> classified patients into 3 grades based on preexisting comorbidities: grade 1 patients were healthy with no comorbidities; grade 2 patients had comorbidities such as smoking, obesity, diabetes mellitus, or a history of wound infection; and grade 3 patients had contaminated and dirty wounds. They found that the risk of SSOs increased significantly with each grade: 14% for grade 1, 27% for grade 2, and 46% for grade 3. Looking at a broader range of surgical procedures, numerous other studies have found a very clear association between tobacco use,<sup>3,4</sup> malnutrition,<sup>5</sup> obesity,<sup>6</sup> hyperglycemia,<sup>7</sup> and the risk of SSOs. In particular, Giordano et al<sup>6</sup> found significant increases in SSOs when body mass index (BMI) was greater than 31.9 kg/m<sup>2</sup>.

The impact of comorbidities on hernia recurrence is not as clear-cut in the literature. Our surgical experience, as well as other surgeons', has suggested increased rates of hernia recurrence with increasing BMI (rates of hernia recurrence at 2 years are 8% in BMI between 30 and 39 kg/m<sup>2</sup>, 25% in BMI between 40 and 49 kg/m<sup>2</sup>, and 45% in BMI >50 kg/m<sup>2</sup>).<sup>8</sup> In a retrospective review of 77 patients, Anthony et al<sup>9</sup> found that higher BMI was a significant risk factor for hernia recurrence. In fact, in a prospective study of 160 patients, Sauerland et al<sup>10</sup> found that the risk of hernia recurrence increased 10% for every unit of BMI. The causative relationship between higher BMI and hernia recurrence is not surprising when one considers the fact that higher BMI leads to increased rates of SSO, and in turn, SSOs increase the risk of hernia recurrence, as pieces of evidence by the finding by Martindale and Deveney<sup>11</sup> show that SSOs increase the risk of hernia recurrence 3-fold.

On the other hand, a few other studies, such as that by Giordano et al,<sup>6</sup> have found no relationship between obesity and hernia recurrence. It should be noted that the study by Giordano et al excluded patients with a BMI greater than 40 kg/m<sup>2</sup>, which limits the generalizability of the results.<sup>12</sup>

Dr Lineaweaver also discusses strategies to reduce the rate of SSOs, namely, the fleur-de-lis panniculectomy, with the residual problems of fat necrosis and seroma. To address both problems, we routinely excise any undermined skin with marginal blood supply.<sup>13</sup> We have also found that modifying the fleur-de-lis panniculectomy to a Mercedes pattern places the T-junction higher, while ensuring well-vascularized flaps with obtuse angles and minimal undermining.<sup>12,14</sup> This helps with both problems of fat necrosis and seroma. Other strategies that are proven to reduce seroma formation in abdominal wall reconstruction and that we use regularly include closed-suction drains kept in place until daily output is less than 20 mL for 2 consecutive days,<sup>15</sup> incisional negative pressure wound therapy,<sup>16</sup> and progressive tension sutures.<sup>17</sup>

Although surgical technique is important for success in abdominal wall reconstruction, we would argue that preoperative optimization of any patient comorbidities is even more important.<sup>18,19</sup> In most cases, abdominal wall reconstruction is an elective endeavor aimed at improving the patient's quality of life. Knowing which patients to operate on and when to operate is at least as important as knowing how to operate.

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Received June 30, 2018, and accepted for publication, after revision July 3, 2018.

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Conflicts of interest and sources of funding: Dr Janis has served as a prior consultant for LifeCell, Bard, Pacira, and Allergan within the last 12 months, but has no active affiliations. He receives royalties from Thieme Publishing. Dr Khansa has no financial disclosures.

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ISSN: 0148-7043/18/8104-0381

DOI: 10.1097/SAP.0000000000001597

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