

# Obesity and surgery in general

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Within three months of the first reported COVID-19 case in 2019, the extraordinary spread of the disease led the World Health Organization (WHO) to change its designation from an epidemic to a pandemic. By mid-May 2021, 162 663 552 infections and 3 374 574 deaths have been recorded. In 2020 11 899 publications addressed or commented on surgery in the context of COVID-19. Overweight and obesity globally affect more than 1.9 billion adults and lead to an estimated four million premature deaths annually (WHO, 2020). The increase in incidence and prevalence affects both developed and developing countries and projections are that 60% of the world population (3.3 billion people) will be overweight or obese by 2030.<sup>1</sup> The official WHO designation of the disease is still an epidemic, despite many authorities believing it fits the definition of a pandemic. In a recent editorial in this journal, the obesity pandemic in South Africa was contextualised and the challenges in establishing metabolic/bariatric surgical services in this country were highlighted.<sup>2</sup> However, the cardiovascular, respiratory, endocrine, gastrointestinal and metabolic clinical conditions associated with obesity impact significantly on surgical practice not only in the bariatric field, but in surgical procedures in general.

In this issue of the SAJS, a letter from Keli et al. draws attention to the fact that obesity is pertinent to general surgical procedures by demonstrating significantly longer laparoscopic cholecystectomy operating times as weight increases, though how this contributes to more substantial endpoints such as complications or hospital stay requires analyses of larger datasets. Also in this issue, a short report on pilonidal sinus surgery in children and adolescents shows that excess weight and gender were interrelated risk factors for postoperative recurrence. The remaining question from this study is which interventions will lower the reported recurrence rates. Studies with improved datasets and rational interventions are needed for general surgical procedures because at present most of the information on obesity management in surgery is extrapolated to the general surgical situation from basic and applied research into pathophysiology of the metabolic syndrome and the effectiveness of metabolic/bariatric surgery.<sup>3</sup>

Obesity is a major driver of the metabolic syndrome and is implicated in the pathogenesis of several surgical diseases.<sup>4,5</sup> Adipose tissue, especially when distributed centrally, functions as an endocrine and paracrine organ producing bioactive substances including chemokines and cytokines which precipitate obesity-related metabolic dysfunction manifesting as atherogenic dyslipidaemia, high blood

pressure, respiratory depression, insulin resistance, glucose intolerance and prothrombotic and proinflammatory states.<sup>6</sup> Consideration of these factors is crucial when planning the perioperative management of obese patients to ensure optimal surgical outcomes.<sup>7</sup>

General preoperative measures also apply to obese patients and include the cessation of tobacco use four weeks before surgery. In addition, diligent work-up to identify obesity-specific conditions which may impact on the perioperative course is required. Determinants of glycaemic control and assessment for obstructive sleep apnoea syndrome (OSAS) are mandatory.<sup>7</sup> A high STOP-BANG score suggests a high probability of sleep apnoea, and further assessment and management by a sleep physician is advisable.<sup>8</sup> Thromboprophylaxis is required for all obese patients undergoing major surgery. These and other comorbidities should be incorporated into individualised rehabilitation programmes to optimise obese patients for surgery.<sup>9</sup> The Obesity Surgery Mortality Risk Score (OS-MRS) was developed and validated for predicting risk of death in patients undergoing bariatric surgery but has not been validated for non-bariatric surgery.<sup>10</sup>

There are important perioperative anaesthetic considerations. Difficult intubation and bag mask ventilation are common.<sup>9,11</sup> Strategies to limit these problems include preoperative removal of beards and ramping for intubation (where the tragus of the ear is in line with the sternum).<sup>9</sup> Video laryngoscopy is preferred to direct laryngoscopy as it allows better visualisation, endotracheal tube first pass success and a shorter time to intubation.<sup>12</sup> Obstructive sleep apnoea syndrome patients frequently have sleep disordered breathing. Anaesthesia tailored to decrease the 'anaesthetic load' is a strategy to minimise these effects. The principles of this strategy are the use of short-acting agents, multimodal analgesia, regional techniques, depth of anaesthesia monitoring, and short-acting neuromuscular blockers with monitored confirmation of complete reversal.<sup>9</sup> Slight head-up positioning and lung recruitment strategies, including increased PEEP and recruitment procedures, are recommended, although the evidence supporting this recommendation is limited.<sup>9,13</sup>

Excess abdominal fat complicates abdominal surgical procedures, both open and laparoscopic. Special equipment may be needed, such as wide operating tables and lifting/transferring equipment with increased weight capacity, extra-long abdominal instrument sets and retractors and extra-long laparoscopes, instruments and stapling, haemostatic, and

energy devices. In laparoscopic procedures, higher baseline intra-abdominal pressures in obese subjects require higher CO<sub>2</sub> insufflation pressures to create sufficient workspace. The higher pressures and increased systemic absorption of CO<sub>2</sub> amplify the haemodynamic, respiratory and renal effects of increased intra-abdominal pressure. Increased operating times have been reported for most abdominal surgical procedures.<sup>14</sup> Differences in volume of distribution and clearance of antibiotics in obese subjects may also require modified protocols for the use of prophylactic antibiotics where indicated.<sup>15</sup>

Immediate postoperative recovery care unit management should focus on the monitoring and preventing of hypoventilation. Obese patients should be nursed in the head-up position, oxygen therapy, and continuous positive airway pressure (CPAP), if previously required, should be continued.<sup>9</sup> High flow nasal cannula may prevent reintubation in obese patients postoperatively.<sup>16</sup> Discharge to the ward from the recovery unit is possible once there are no signs of hypoventilation.<sup>9</sup> Postoperative high dependency unit care should be considered in patients with other comorbidities, stratified as high risk using the OS-MRS, potential or confirmed OSAS requiring postoperative opioids, complicated surgical procedures, and where postoperative surgical wards have limited resources to manage these patients.<sup>9</sup> Longer operating times and direct effects of metabolic syndrome contribute to the general higher risk of postoperative complications in obese patients. These include deep venous thrombosis (DVT), surgical site infections (SSI), wound dehiscence, pneumonia, urinary tract infection and renal failure.<sup>17</sup> Higher risks of anastomotic leakage in oesophageal, gastric and colorectal surgery, and pancreatic fistula following pancreato-duodenectomy have been reported in the obese.<sup>14</sup> This higher incidence of complications together with longer operation times is associated with significant increases in financial cost of surgery for obese patients.<sup>18</sup>

Hopefully, the COVID-19 pandemic will soon, like the Black Death and Spanish Flu, be relegated to a chapter of medical history. The obesity pandemic will remain, with the number of patients annually succumbing to the disease exceeding the number of COVID-19 deaths in 2020 by a factor of at least two. With the prediction that 60% of the world population will be overweight in less than a decade from now, overweight or obese patients presenting for surgery will become the rule and not the exception. The surge in bariatric surgery around the turn of the 20<sup>th</sup> century prompted identification of specific needs for the optimal and safe care of obese patients undergoing weight loss surgery, including specialised personnel, equipment, and infrastructure.<sup>19</sup> These measures and interventions need to be extended to the surgical population at large with the integration of unique obesity-related measures into Enhanced Recovery After Surgery (ERAS) concepts. Renewed and intense focus on the impact of being overweight or obese on all aspects of surgical care is long overdue and a matter of urgency.

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