

## How to Decrease the Surgical Related Inflammation in Bariatric and Metabolic Surgery

**Juan Pujol Rafols\***

*Head of the Surgery Service of the Tres Torres Clinic in Barcelona, Spain*

**\*Corresponding Author:** Juan Pujol Rafols, Head of the Surgery Service of the Tres Torres Clinic in Barcelona, Spain.

**Received:** August 17, 2019; **Published:** September 30, 2019

In 1932 Cannon defined the word homeostasis as the coordinated physiological processes which maintain most of the steady states in the organism. Homeostasis is a delicate dynamic equilibrium that can be broken by any external aggression [1].

It is more than obvious that surgery implies a physical aggression that challenges the patient's body and is followed by a quick response that tries to restore the original state. This process is classically known as the inflammation process.

The surgical incision induces localized injury to tissues, afferent nerves, pain receptors and blood vessels that leads to afferent signals from the injury site to the brain and stimulates the neural, hormonal and immune systems.

Every local tissue damage performed when we are operating, leads to ischemia, oedema, immune response, and metabolic dysfunction who all contribute to a succession of rapidly cascading events from a local to a systemic phenomenon that can stress our patient and which collectively constitutes the "stress response".

To a certain extend, an adequate stress response is advantageous for patients but excessive stress can lead to a pathological state. The system can quickly "overshoot" and result in potentially harmful outcomes such as cardiovascular dysfunction, inflammation, coagulopathy and possibly immunosuppression. Therefore, an attenuated inflammatory response could lead to a faster recovery and minimizes the impact of treatment.

As surgeons, the best way to lower the surgical stress and the subsequent inflammatory response, is to do less harm, to avoid any unnecessary tissue damage.

Throughout the history of surgery there has been a progressive advance in perioperative medicine, better infection control and above all a fantastic technical evolution that has allowed us to carry out operations with far less aggression.

During this evolution there has been many clear steps towards a less stressing surgery. In the recent years we have heard a lot about the terms fast-track and ERAS (which stands for Enhance recovery after surgery) clinical protocols that could be seen as a compilation of perioperative steps systematically joined with the objective of diminishing the stress response and the inflammation process after surgery. The following paragraphs are an overview of the most relevant steps to reduce the inflammatory process and the stress response related to the surgical procedure.

Number one: Be prepared and well trained.

Surgery begins long before the first incision. A good surgical training is the base to improve our future results. Reduction in morbidity and mortality has been shown to occur as a function of surgical experience. The better prepared, the better trained, the less morbidity [2-5].

Following IFSO guidelines “Bariatric surgery necessitates the appropriate training. It is vital that the surgeon has the optimal theoretical knowledge, and the necessary technical skills” [6].

Number two: Ask for help. Bariatric surgery is a multidisciplinary work. It is a team commitment. Physicians, Anaesthesiologist, psychologists, endocrinologist, nurses, pharmacist, dieticians, physical therapist...they are all welcome for the good of our patient.

Number three: Involve the patient. Educate, inform, and prepare your patient before surgery.

It is well known that the obese patient is a complex one who already suffers from multiple comorbidities. A preoperative improvement of our patient’s physiological status results in an improved postoperative course and decreased complications [7].

Involve the patient. Make him feel part of the team. Make your patient lose weight, plan a correct feeding program before surgery [8,9]. Encourage your patient to stop smoking and drinking alcohol [10-12].

Number four: The less invasive the better.

The surgical stress originates an immune, hormonal and metabolic response that is directly proportional to the intensity of the surgical trauma.

Ishibashi and colleagues showed that IL-6 levels (proinflammatory mediator) correlated with the length of a surgical incision with the larger incision leading to doubling its values [13]. The less aggressive, the less inflammation.

It is well demonstrated that with laparoscopic and minimally invasive surgery the tissue damage is much less than in open surgery with a significant reduction in the postoperative levels of C-reactive protein, leukocytes and other cytokines [14]. Laparoscopic surgery significantly reduces hospital stay, incisional hernia, blood loss and postoperative pain and leads to an earlier recovery [15-17].

Number five: Avoid complications.

Be consciously delicate during surgery, there is no need to hurry. Studies demonstrate that circulating IL-6 levels which is a reliable acute inflammatory marker, appears to be proportional to the extent of tissue injury, more than to the duration of the surgical procedure itself [18], so better take your time if you need it, but don’t do unnecessary harm.

Avoid bleeding, Bleeding leads to ischemia. Control the bleeding and correct intravascular volume. Tissue requires adequate oxygen to improve the healing process.

Avoid infections, use prophylactic antibiotics. Avoid gut ischemia. Be accurate with the anastomosis. Failure of the intestinal barrier either by an anastomotic leak or bacterial translocation is an important etiological factor of sepsis and multiple organ failure.

Prevent deep vein thrombosis and thromboembolism. They are the second leading cause of death in bariatric surgery. We have to do everything in our power to avoid such a serious complication. Mechanical methods should be combined with pharmacological prophylaxis with low molecular weight heparins (LMWH) that should be maintain during weeks after the procedure [19,20].

Be active preventing hypothermia by heating the patient with forced air blankets and intravenous fluids. It will reduce risks of wound infection, and lower the complication rate, attenuates the stress of operation and improves outcome.

Number six: Avoid any unnecessary stress. Nasogastric tube for example, several studies demonstrate it is useless, it does not protect any anastomosis, it is a pain and a stress factor for the patient that can provoke nausea and vomiting, throat inflammation and even pulmonary infection [21,22]. Just remove it before reversal of anesthesia.

Avoid or decrease systematic use of urinary catheter as can act as a vector for infections.

Keep drains the shortest possible time, drains are foreign bodies, potential focus of infection and stress for the patient [23].

Don't make the patient suffer unnecessary nausea, vomiting or pain as it could be a stress factor leading to an increased inflammatory response. Use multimodal systemic analgesia [24,25], local anesthetic infiltration techniques [26,27] and combine different antiemetic drugs in a standardized way [28].

Encourage early patient mobilization. Early mobilisation not only will prevent deep vein thrombosis but also facilitates breathing and functional recovering [29].

Keep the patient in a positive atmosphere, take care of their respiratory function, plasma glucose levels, blood pressure and other concomitant physiological parameters.

Encourage early enteral feeding in order to restore their physical autonomy [30] and finally send them home as soon as they are prepared. Prolonging an unnecessary stay in hospital is obviously a stress factor.

### Bibliography

1. Cannon WB. "The Wisdom of the Body". WW Norton and Company, New York (1932): 177-201.
2. Schauer P, *et al.* "The learning curve for laparoscopic Roux-en-Y gastric bypass is 100 cases". *Surgical Endoscopy* 17.2 (2003): 212-215.
3. Shikora SA, *et al.* "Laparoscopic Roux-en-Y gastric bypass: results and learning curve of a high-volume academic program". *Archives of Surgery* 140.4 (2005): 362-367.
4. Ali Mohamed R, *et al.* "Validation that a 1-year fellowship in minimally invasive and bariatric surgery can eliminate the learning curve for laparoscopic gastric bypass". *Surgical Endoscopy* 24.1 (2010): 138-144.
5. Sánchez-Santos R, *et al.* "Training Programs Influence in the Learning Curve of Laparoscopic Gastric Bypass for Morbid Obesity: A Systematic Review". *Obesity Surgery* 22.1 (2012): 34-41.
6. Melissas J. "IFSO Guidelines for Safety, Quality, and Excellence in Bariatric Surgery". *Obesity Surgery* 18.5 (2008): 497-500.
7. Thorell A, *et al.* "Guidelines for Perioperative Care in Bariatric Surgery: Enhanced Recovery After Surgery (ERAS) Society Recommendations". *World Journal of Surgery* 40.9 (2016): 2065-2083.
8. Van Nieuwenhove Y, *et al.* "Preoperative very low-calorie diet and operative outcome after laparoscopic gastric bypass: a randomized multicenter study". *Archives of Surgery* 146.11 (2011): 1300-1305.
9. Anderin C, *et al.* "Weight loss before bariatric surgery and postoperative complications: data from the Scandinavian Obesity Registry (SOReg)". *Annals of Surgery* 261.5 (2015): 909-913.
10. Sorensen LT, *et al.* "Abstinence from smoking reduces incisional wound infection: a randomized controlled trial". *Annals of Surgery* 238.1 (2003): 1-5.
11. Moller AM, *et al.* "Effect of pre-operative smoking intervention on postoperative complications: A randomised clinical trial". *Lancet* 359.9301 (2002): 114-117.

12. Warner DO., *et al.* "Effect of nicotine replacement therapy on stress and smoking behavior in surgical patients". *Anesthesiology* 102.6 (2005): 1138-1146.
13. Ishibashi S., *et al.* "Length of laparotomy incision and surgical stress assessed by serum IL-6 level". *Injury* 37.3 (2006): 247-251.
14. Gupta A and Watson DI. "Effect of laparoscopy on immune function". *British Journal of Surgery* 88.10 (2001): 1296-1306.
15. Lujan JA., *et al.* "Laparoscopic versus open gastric bypass in the treatment of morbid obesity: a randomized prospective study". *Annals of Surgery* 239.4 (2004): 433-437.
16. Nguyen NT., *et al.* "Laparoscopic versus open gastric bypass: a randomized study of outcomes, quality of life, and costs". *Annals of Surgery* 234.3 (2001): 279-289.
17. Westling A and Gustavsson S. "Laparoscopic vs open Roux- en-Y gastric bypass: a prospective, randomized trial". *Obesity Surgery* 11.3 (2001): 284-292.
18. Lin E., *et al.* "Inflammatory cytokines and cell response in surgery". *Surgery* 127.2 (2000): 117-126.
19. Zareba P., *et al.* "Meta-analysis of randomized trials comparing combined compression and anticoagulation with either modality alone for prevention of venous thromboembolism after surgery". *British Journal of Surgery* 101.9 (2014): 1053-1062.
20. Moulin PA., *et al.* "Perioperative thromboprophylaxis in severely obese patients undergoing bariatric surgery: insights from a French national survey". *Surgery for Obesity and Related Diseases* 13.2 (2017): 320-326.
21. Nelson R., *et al.* "Prophylactic nasogastric decompression after abdominal surgery". *Cochrane Database Systematic Reviews* 3 (2007): CD004929.
22. Huerta S., *et al.* "Assessment of routine elimination of postoperative nasogastric decompression after Roux-en-Y gastric bypass". *Surgery* 132.5 (2002): 844-848.
23. Kavuturu S., *et al.* "Routine drain placement in Roux-en-Y gastric bypass: an expanded retrospective comparative study of 755 patients and review of the literature". *Obesity Surgery* 22.1 (2012): 177-181.
24. Ziemann-Gimmel P., *et al.* "Multi- modal analgesia reduces narcotic requirements and antiemetic rescue medication in laparoscopic Roux-en-Y gastric bypass surgery". *Surgery for Obesity and Related Diseases* 9.6 (2013): 975-980.
25. Maund E., *et al.* "Paracetamol and selective and non-selective non-steroidal anti-inflammatory drugs for the reduction in morphine-related side-effects after major surgery: a systematic review". *British Journal of Anaesthesia* 106.3 (2011): 292-297.
26. Beaussier M., *et al.* "Wound infiltration with local anesthetics for postoperative analgesia. Results of a national survey about its practice in France". *Annales Françaises d'Anesthésie et de Réanimation* 31.2 (2012): 120-125.
27. Moncada R., *et al.* "Does Preincisional Infiltration with Bupivacaine Reduce Postoperative Pain in Laparoscopic Bariatric Surgery?" *Obesity Surgery* 26.2 (2016): 282-288.
28. Gan TJ., *et al.* "Consensus guidelines for the management of postoperative nausea and vomiting". *Anesthesia and Analgesia* 118.1 (2014): 85-113.

29. Lemanu DP, *et al.* "Randomized clinical trial of enhanced recovery versus standard care after laparoscopic sleeve gastrectomy". *British Journal of Surgery* 100.4 (2013): 482-489.
30. Osland E., *et al.* "Early versus traditional postoperative feeding in patients undergoing resectional gastrointestinal surgery: a meta-analysis". *Journal of Parenteral and Enteral Nutrition* 35.4 (2011): 473-487.

**Volume 2 Issue 7 October 2019**

**©All rights reserved by Juan Pujol Rafols.**