

Damage Control Surgery in the Light of a New Paradigm: Damage Control Resuscitation

Each year, 6 million people worldwide lose their lives due to serious injuries associated with major traumas. The most common cause of death among trauma patients is uncontrolled hemorrhage and associated coagulopathy. It is believed that 20 per cent of these individuals can be saved (1). Damage control surgery is a life-saving treatment modality that emerged by mid-20th century and undergone various changes so far (1-3).

The damage control surgery consists of 5 steps. Initially, the patient triage must be performed properly. The second step takes place in the theatre. This first attempt must be completed within one hour at most. The temperature in the operation room must be at 26°C. All intravenous fluids should be warm. In this step, the aim would be to control hemorrhage, limit contamination and quickly re-close the surgical incision. During this instance, it is not recommended to execute definitive operation procedures for vessels, intestines or the liver. This means, it is not advisable to perform arterial grafting, vascular anastomosis or intestinal anastomosis. The abdomen must be cleaned, the vessels must be temporarily stitched, tied or pressured using balloon or tamp or shunting should be employed. Intestinal injuries should be temporarily bound and liver should be packed using pads. The abdomen must be closed as quickly and simply as possible. The third phase takes place in intensive care unit. Hypovolemia, acid-base equilibrium issues and coagulation should be tackled to stabilize the patient. The fourth phase entails definitive surgery. The fifth phase is the final step where the reconstruction and rehabilitation is conducted for all issues emerging during other phases (2).

From past to present, the treatment approach for trauma patient includes protocolized resuscitation, followed by application of damage control surgery and finalized by taking patient into intensive care unit. Stabilizing patients in the intensive care unit, the treatment continues with gradual operations. In fact, it is now recommended to implement damage control resuscitation and damage control surgery in conjunction with each other. According to this recent paradigm, the physician should act in consideration of the patient's physiological state, instead of managing the treatment by following pre-defined protocols. The patient's physiological state must be closely observed through real-time monitoring and the treatment plan must be designed in accordance. In short, damage control surgery and damage control resuscitation

must be construed as a single concept (2). The principle aim of this approach is to return the patient's body heat to optimal levels, to remedy circulatory issues and to prevent coagulopathy. In this way, patient's life will be saved from the vicious cycle or lethal triad (hypothermia, acidosis and coagulopathy). It is reported that majority of patients that receive this manner of treatment do not require further operation. In this way, even if the problems persist despite all treatment approaches, the surgical treatment applied to the patient will be more effective (1-3).

In this issue of our journal, we are introducing one of the recently published, significant books on wartime surgery, *War Surgery: Field Manual*. This book review that you can find in the following pages of our journal presents philosophical changes in the approach to trauma patients, as we expressed above. It is apparent that we are going through a period of fundamental changes in the surgical mentality, similar to the periods following the first and second world wars. Furthermore, some authors even go far as to believe that we are at the beginning of the end for damage control surgery that came under intense discussions during 70s and became popular during 80s (3).

Now, it is obvious that damage control resuscitation, integrated into damage control surgery, will be subject to further discussion. Hemostatic resuscitation is strongly highlighted both in civilian and military manuscripts and books. It should not be ignored the issues associated with coagulopathy becomes prominent in the treatment of traumatic patients and, unusual results may end up using artificial blood and blood products.

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