PRACTICE GUIDELINES: DAMAGE CONTROL

OBJECTIVE:

Define the technique and expectations of "damage control" used in the operating room to temporarily control life-threatening injuries. Define the situations in which "damage control" should be helpful in stabilizing patients.

DEFINITION:

Damage control: Is an operative technique in which control of bleeding and stabilization of vital signs becomes the only priority in salvaging the patient. This usually occurs during laparotomy when there is significant bleeding in the abdomen. Attention is directed at using all available techniques for controlling bleeding, including packing. Definitive repair of bowel or visceral injuries in not attempted and temporary wound closure is used. Definitive procedures are performed after the patient has stabilized.

GUIDELINES:

1. The patient with severe abdominal and/or thoracic (if indicated) injuries with suspected bleeding is brought to the OR immediately.

2. Inform the anesthesiologist of the severity of the injuries so that appropriate intravenous access can be obtained. Two large bore intravenous are essential.

3. In the unstable patient, initiate the MTP early; Consider TXA.
   a. Provide hypothermia protection (Warmer/Rapid infuser)
   b. Warm the room.
   c. Bair Hugger.
   d. Warm IV fluids.

4. Open the abdomen and assess the injuries, pack all four quadrants and examine for mesenteric bleeding. Control bleeding first!

   Technique of damage control:
   a. Remove the packs for areas of likely bleeding first.
   b. Control all surgical bleeding as rapidly as possible. Do splenectomy rather than splenorrhaphy, nephrectomy rather than renorrhaphy. Pack areas of oozing: liver, retroperitoneum, pelvis, mesentery.
   c. Consider hemostatic adjuncts such as tisseal, everest etc.
   d. Once the bleeding is controlled, examine for other injuries.

5. Management of intestinal injuries:
   a. Small holes: whip stitch with a running or interrupted suture. Large defects or devitalized areas: resect the affected area with GIA stapler. Do not attempt to reanastomose.
   b. Do not create ostomies.
   c. Assess/Re-Assess bleeding. If non-surgical bleeding is controlled with packing, either leave the packs in place or re-pack the area with laparotomy sponges or moist towels. Consider using a

Vi-drape (two of them stuck together to avoid the adhesive edge) over the surface of the liver to facilitate pack removal.

6. The goal of this procedure is to stop the surgical bleeding and get the patient to the ICU where the clotting factors may be replaced and physiologic disturbances such as acidosis, hypoxemia and ischemia may be definitively corrected. Once the decision for damage control has been made, proceed rapidly. The goal of this procedure is to stop the bleeding and get the patient to the ICU where the clotting factors may be replaced and physiologic disturbances such as acidosis, hypoxemia and ischemia may be definitively corrected. Damage control is key:
    a. Hypothermia, coagulopathy, non-surgical brisk bleeding.
    b. Diffuse oozing from cut or injured surfaces.
    c. Diffuse uncontrollable retroperitoneal or pelvic bleeding.
    d. Severe fracture of the liver that cannot be controlled with ligation, suture or clips.
    e. Massive bleeding from multiple sources in which it appears that definitive care of all injuries may lead to prolonged operative time or additional bleeding which could lead to hypothermia or coagulopathy.

7. Close abdomen with an Athera VAC

    a. Return to the ICU rapidly to improve cardiac output, acidosis, hypothermia, coagulopathy.
    b. Measure intra-abdominal pressure through Foley as necessary. You can still get compartment syndrome with a abdominal VAC dressing.
    c. Return to the OR for definite procedure and fascial closure when:
        i. Normothermic.
        ii. Coagulopathy resolved.
        iii. Hemodynamics are stabilized.
        iv. Usually 48-72 hours.

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**line drawings in this article are modified from 'Trauma Surgery', Arthur Donovan (ed), Mosby Year Book 1994*