
Depending on the **size of the wound**, Albucasis described 3 types of abdominal tears, namely:

* **Large** in which many segments of gut may protrude making the intestinal reduction and wound suturing difficult.

• **Small** tears are difficult too, for they are bound to be harder to reduce and if one does not hurry to return the gut to its place at once, it will swell up and enlarge, thus rendering reduction difficult.

* **Medium-sized** tear is therefore the best, as far as intestinal reduction and abdominal wall suturing are concerned.

He explained that reduction of protruded gut may be difficult for 2 reasons: either on the account of small abdominal tear, or because the gut has become inflated on account of exposure to cold air. In the latter, Albucasis recommended warming the gut by fomenting with a sponge or piece of cloth bathed with warm water or water in which have been boiled rushes and cyperus and hyacinth, bathing the gut until the inflation is gone down; once the swelling has come down, gut must be bathed with infused water of althea and mallows enhancing the reduction with lightest effort. If these attempts fail due to the constricting abdominal wound, he advised an extension of the wound by incising one end with the snare (curved knife or hook) used in treatment of piles. Albucasis then described best **patient's positioning** while performing surgery on such cases; in lower abdominal injury, he recommended legs elevation while the patient is supine (lying on the back) to allow gravity aid in reduction. Conversely, upper abdominal injury necessitates head elevation.

He then described 4 methods of **abdominal wound closure**, 2 general and 2 special (used by Galen).

- The 1st general method is used in small abdominal wounds using one or 2 needles inserted through all abdominal layers of both sides but maintained in position and tightened by double looped threads to approximate wound edges (**continuous through and through mass closure**).
- The 2nd general method entails **interrupted through and through figure-of-8 stitches** like **sewing bags**.
- The 1st special (or the 3rd) method is by continuous through and through but with alternative inclusion of the peritoneum on one side each time (likened by Albucasis to **furriers' sewing**).
- The 2nd special (or the 4th) method is **separate continuous layered closure** of the musculo-cutaneous and peritoneal layers; Albucasis preferred this method to others.
- He also described a 5th method of suturing abdominal wall by using 2 needles mounted on one thread inserted on both sides of the wound with alternate bites, but in one direction (likened by Albucasis to **shoemakers' sewing**).

For **haemostasis**, Albucasis recommended that bleeders must be sought out; they then must either be ligated or cauterized; small oozers can be controlled by pressure with a pad soaked in wine (alcohol) and olive-oil, or vinegar and olive-oil.

As for **postoperative treatment of wounds**, any sign of inflammation requires dressing with cotton wool soaked in oil of roses with or without astringent beverage. If there is no inflammation, then the wound with its fresh blood can be sprinkled by a powder (composed of olibanum, dragon's blood, and lime all beaten and sieved) to bind the wound tightly. If the wound became purulent, then twice daily dressing with teased-out cotton wool until dry and washing by honey-water daily is applied. If the abdominal wound was extensive, soft wool dipped in warm olive-oil, or oil of roses bound around the abdomen is recommended.

According to Albucasis, **healing of intestinal injuries** is variable; colonic faecal fistula may heal spontaneously, but the jejunum bleeds readily in abdominal injury due to its extensive vascularity, and is therefore difficult to heal. Gangrenous omentum must be ligated above the line of gangrene and cut off. As far as the viability of the intestine is concerned, the gangrenous segment must be cut off and repaired as for small intestinal wound. The method of suturing of intestine is by application of large