Omentoplasty or Kiricuta’s Flap

The use of the greater omentum in breast cancer surgery was first described by Kiricuta in 1963.

The advantages of the greater omentum have been long recognised in numerous situations, including salvage of “at risk” intestinal anastomoses, tamponade of diffuse haemorrhage, particularly from the liver, and perineal defect restoration. It can also be used to pack fistulae, notably large vesicovaginal fistulae such as those seen in Africa.

Without dwelling on its complex embryology, the greater omentum is a richly vascularised structure that originates from the greater curvature of the stomach, between the right gastroepiploic vessels (from the hepatic artery), the gastroduodenal, and the left gastroepiploics (from the splenic artery). The arterial circle begins at the anastomosis between these two systems, which constitutes the arterial supply of the greater curvature of the stomach. The greater omentum is vascularised by vessels that branch perpendicularly from the greater curvature. The greater omentum is thus richly vascularised by the two high-flow hepatic and splenic arteries and consequently presents a very low ischaemic risk, even with division of one of the afferent arteries.

There are also numerous anastomoses (visible by transillumination) between the two areas, which have no regular pattern.

Physiologically, the greater omentum is a “reserve” zone and so its volume varies widely between individuals. Actually, in northern latitude populations, it is generally voluminous and, contrary to what one might imagine, not comprised exclusively of fat. In fact, as with the peritoneum, it contains numerous lymphatics and a highly developed microvascular network. It is this rich vascularisation that allows it to be used in plastic surgery, particularly in infected areas.

It is possible to release the greater omentum and use it as a flap for coverage of cases of substance loss in the anterior thoracic wall, and for many years its primary indication was the coverage of cutaneous radionecrosis.

To harvest this flap, a complete gastrocolic dissection must be performed, usually via laparotomy. It is acceptable to completely free the right and left angles of the omentum, visualising the second part of the duodenum to the right and the spleen to the left.

The dissection is by definition avascular, as it corresponds to the physiological adhesions of the gastric peritoneum and the transverse mesocolon in forming the gastrocolic ligament. The appearance of bleeding indicates that one has left the correct dissection plane! This dissection opens the cavity behind the omentum, which contains avascular adhesions that must be divided for correct mobilisation of the omentum. Also visible is the body of the pancreas in the depths of the greater sac.

According to the side and the site of placement of the omentum, one pediculises the flap on one side or the other, generally contralaterally for thoracic reconstruction.

Ligatures must be placed between the arterial circle and the gastric wall. There is no risk of ischaemia to the gastric wall due to the rich and multiple intraperitoneal anastomoses.

Distally, the arterial circle must be carefully preserved in order to maintain a good vascular supply to the omentum. This dissection is not technically difficult, but must be done meticulously, and is a little lengthy on occasion because the omentum must be
completely freed to allow its correct placement in the required area.

For thoracic coverage, the flap must be reflected superiorly and cross the abdominal wall en route to the thorax, where it is spread and attached. Surfaces of 300–1,500 cm² over areas 14–36 cm in height and 22–43 cm in width may thus be obtained.

Once positioned on the thorax, the omentum oozes abundantly and requires regular nursing care. It may be covered with a skin graft either at the time of flap harvest or some days later according to the surgeon’s preference and the degree of cleanliness of the procedure. The graft typically does not “take” in its entirety at first, and a degree of secondary intention healing is the rule. A long-term failure of healing usually suggests the persistence of necrotic tissue, particularly bone.

Utilisation of the recently introduced vacuum-assisted closure (VAC) device may significantly shorten healing times (Ferron 2007).

The particular properties of the greater omentum allow it to be used to close infected and necrotic surfaces simply which renders this flap especially appealing when musculocutaneous flaps are either unavailable or being held in reserve.

However, the greater omentum may not be available, for example after excision, after its use in previous intestinal procedures and after cases of abdominal infection or trauma, so a careful history must be obtained from the patient. The patient’s morphology is not a contraindication, and only extreme obesity or cachexia can pose technical problems.

Passage of the flap at the level of the xiphoid and/or costal margin constitutes a potentially weak area, with the risk of future herniation. Closure of the wall may be done without difficulty with a section of the omentum, which quickly acquires autonomous circulation.

Since 1993, it has been possible to harvest the greater omentum laparoscopically (Saltz 1993). This must be done by surgeons experienced in this technique and, according to the literature, the operative time is increased by about an hour, but modern techniques and instrumentation may well reduce this further. As with all laparoscopic surgery, abdominal scars are minimal, but the area of flap delivery and passage towards the recipient area leaves the risk of herniation as noted above.

The quality of the vessels of the omentum has led to its use as a free flap in certain cases; with well-trained teams, this can give excellent results. Despite the additional risks associated with microvascular anastomoses, it is worth remembering that abdominal wall closure is optimised and should not result in a risk of herniation.

Chauvet et al. (2006) recently published a breast reconstruction technique that uses the greater omentum. This is harvested as described above and then placed on the thorax following mastectomy. It is then modelled to form a volume compatible with the reconstructive requirement. Of course, this is only relevant in a few highly selective cases involving irradiated, well-informed patients with a particular morphology (small breasts, voluminous omentum) who are able to accept the risks of this technique and the eventual placement of a complementary implant.

**Conclusion**

The greater omental flap has lost a little of its notoriety because of significant developments with musculocutaneous flaps. The quality of this flap, its rich vascularisation, and its potential benefits in infected areas have made it indispensable to all those who manage breast cancer and its complications. At the boundary of intestinal surgery, oncological breast surgery and oncoplastic surgery, knowledge and use of this flap should be added to the armamentarium for breast cancer management.

**Local Fasciocutaneous Flaps**

**Holmström Flap**

Described in 1986 by Holmström (Pontes et al. 2006), this flap was then reported by numerous authors under the name of the lateral thoracodorsal flap (Lossing et al. 2001, 2000; Holmstrom and Lossing 1986).

We use it for tumours of the inferior pole in ptotic breasts, to avoid inverted-T scars, and for symmetrisation of a noncancerous breast (Plate 4.1).