Components of a Laparoscopic Operating Room (OR) set up (Figs 1.3 to 1.5)

Components of OR set up include imaging systems, insufflators, hemostatic generators and instrumentation. For carrying out a surgical procedure there should be a smooth interaction between the various components and the surgical team.

General principles of laparoscopic or room set up:

1. The OR room should have a vision cart, which should ideally be hanging from a boom. Vision cart has the monitor and below the monitor are 3–4 shelves which house the insufflator, camera unit, light source, electrosurgical units and other hemostatic generators (Fig. 1.3).
2. There should be at least 2 monitors on opposite sides of the OR table. The surgeon should be optically correct and the one monitor should be in front of the surgeon.
3. Insufflator should be just below or along the side of the monitor, during initial cases if the surgeon has to turn to look at the quadromanometric indicator it will be anxiety provoking and also surgeon may

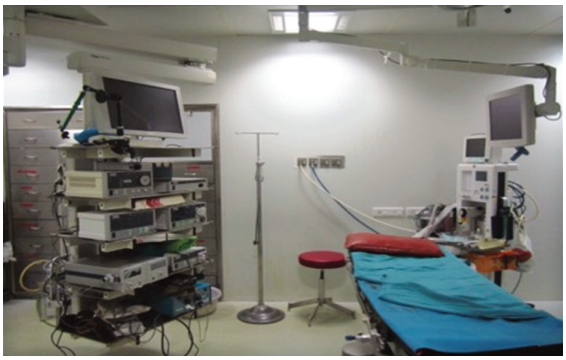

Fig. 1.3: Components of OR set up

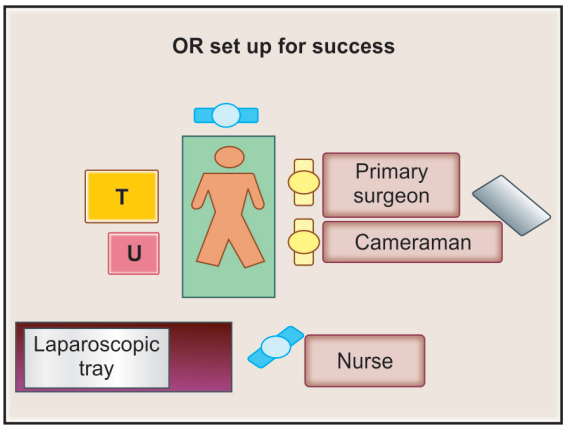

Fig. 1.4: OR set up for right upper tract laparoscopic procedure

Fig. 1.5: OR set up for left upper tract laparoscopic procedure

4. **Linear parallax:** Two parallel lines appear to meet each other at a distance and appear parallel to each other at a closer distance.
5. **Motion parallax:** Structures near appear to move more as compared to deeper structures.
6. **Texture gradient:** Nearer structures appear bright when compared to deeper structures which appear dark.

Mirror Imaging (Fig. 1.15)

It is important to understand the concept of mirror imaging in laparoscopy. When an assistant is standing opposite to the operating surgeon and assisting, though he would be seeing the same image as the surgeon all his movements will be opposite to the surgeon's movement as seen on the screen.

Fig. 1.15: Mirror imaging for the 1st assistant surgeon

Summary of instrument characteristics

- Head should be straight, in axis of trunk, without rotation or extension of the cervical spine.
- Shoulders in relaxed and in neutral position.
- Arms should be along the side of the body
- Elbows should be bent to 70° to 90°
- Forearms in horizontal or in a slightly descending axis
- Hands pronated
- Hands and fingers lightly grip the handles/handpiece
- Gaze should be down
- Neck slightly flexed and in straight line with the monitor.

Ergonomic posture of operating surgeon is shown in Fig. 1.16.

Fig. 1.16: Ergonomic posture of operating surgeon

Co-axial Alignment (Fig. 1.17)

It is an important ergonomic consideration in laparoscopic surgery, the surgeon, target organ and the monitor should be in the same line. The monitor should be slightly lower than the eye level of the surgeon, so that the surgeon has a 15°–20° downward gaze. Downward gaze keeps the sternocleidomastoid muscle relaxed and prevents its fatigue. This will also keep the eye in resting position preventing the oculomotor fatigue.

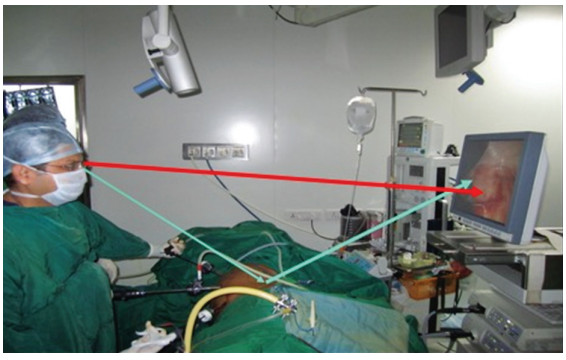

Fig. 1.17: Co-axial alignment

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polyanhydroglucuronic acid. It induces blood clot formation.
2. *Surgicel SNoW™, Fibrillar™:* It is same as Surgicel™ but woven or knitted so that it has better tissue adherence.

Agents commonly used and available as solutions

1. *Floseal™ matrix (Baxter):* It contains thrombin made from human plasma and gelatin granules. The gelatin granules swell up and give a mechanical tamponade effect. The thrombin in Floseal interacts with normal coagulation mechanism and accelerates conversion of fibrinogen to fibrin, resulting in accelerated clot formation.
2. *Surgiflo:* Hemostatic matrix (Ethicon) is absorbable porcine gelatin paste, it is put over the sutured surface of bleeding organ for hemostasis.
3. *Evicel™ (Ethicon):* It is a human fibrin based hemostatic agent, can be stored at room temperature for 24 hours. It is available as airless spray and is not dependent on patient's coagulation profile.

Rescue Stitch and Tray

To salvage bleeding in minimal access surgery a rescue stitch can be used. Bleeding in minimal access environment can be very challenging for the surgeon. Rescue stitch can save the day, when used judiciously.

Rescue stitch is not available commercially but, is made by taking 4 inches of polyglactin 0 or polypropylene 3–0 on a large needle, ideally CT1 needle is suitable as it can be seen in the pool of blood. A thread is knotted at the end of the suture and a Weck™ clip (Teleflex, NC, USA) is applied proximal to it. Once the bleeding vessel is identified, the suture is passed through both the edges of the vessel and then the Weck clip is sinched over the bleeding vessel, this will control more than 50% of the bleeding. Another throw is now passed through the vessel walls making it a figure of 8 stitch and then two ends of the thread are tied to make a secure knot. Rescue stitch is a part of the rescue tray which contains, a Maryland forceps, a needle driver, a Satinsky clamp, Surgicel™ (Ethicon, Somerville, USA) bolster and a cartridge of Weck clip. The Maryland forceps is used to hold the edges of the vessel, needle driver is kept in the tray with a rescue stitch held in the jaws and is used to pass the needle through the bleeding vessels. Satinsky clamp can be used to clamp vessels and Surgicel bolster is used to pack the bleeding area. The rescue stitch should be plasma sterilized and then stuck to the wall of the operating room in accessible position so that it can be readily available for use in emergency.