11377 - Techniques to reduce blood loss in orthopaedic pelvic tumors – a single institution experience of twenty five cases.

Pramod Shekarappa Chinder, Raghunandan Madhavamurthy, Indushekar Subbanna, Shivakumar Swamy, Rohit Madurkar

HCG, Bangalore, India.

BACKGROUND

Orthopedic pelvic tumor resection surgeries are historically known to be complex procedures associated with extensive resection and major blood loss directly amounting to very high rates of morbidity and mortality. Though techniques such as preoperative embolisation have been described in literature, we in our institution follow a multi pronged approach to reduce the perioperative blood loss. The HCG five technique rules are

1. Pre-operative embolisation.
2. Hypotensive anaesthesia.
3. Intra-operative surgical conservation - save blood from word go, Use of bone wax at every step,
4. Use of radio-frequency energy vessel sealing devices (LigaSure®, Valley Lab, Inc.,Boulder Colorado)
5. Computer Assisted Tumor Surgery (OrthoMap 3D, Stryker Orthopaedics, Mahwah, NJ, USA) navigation.

PATIENTS AND METHODS

Prospective case series study of twenty five cases of pelvic tumours

Inclusion criteria: Large volume tumors, fungating tumors, heavily pre-radiated tumors and post whoops surgery.

Exclusion criteria: Small volume tumors, non vascular tumors.All patients underwent pre-operative embolisation twenty four hours prior to surgery targeting complete resolvability of the tumor. DSA (GE Innova IGS540) angiogram of the lesion was acquired initially, followed by catheterisation of the vessel supplying the tumor. Appropriate embolic materials (PVA particles, gel foam or coils) were chosen and embolisation done.

On the following day anaesthesia was induced and hypotensive anaesthesia technique was instituted with nitroglycirine infusion. Radio frequency device (LigaSure®, Valley Lab, Inc., Boulder, Colorado) (Figure 2) was used for vessel sealing and conservation of blood loss from skin incision to closure. Computer Assisted Tumor Surgery (OrthoMap 3D, Stryker Orthopaedics, Mahwah, NJ, USA) navigation was used to ensure complete the tumor resection.

Pre-operative and post-operative hemoglobin (post-op day one), estimation of intra-operative blood loss and total amount of blood transfused were documented.

RESULTS

Pre and post –operative hemoglobin levels did not show a significant drop (mean 2.4 G/dl), hence aiding in better en bloc surgical tumor resection, reduced morbidity and early recovery. Intra-operative blood loss estimated between 800ml to 3000ml (mean 1650ml). Intraoperative blood loss during pelvic surgeries world over have ranged from 400ml to 12100ml[1, 2].

The average number of units of blood tranfused was 4 PRBC (range 0 – 8) units. Two patients did not require any transfusion at all.

A retrospective study of 160 hemipelvectomies reported that the average number of units transfused intraoperatively and during the first 2 days after surgery was 13.4 PRBC (range 0 – 139) units. Another observational study reported a median transfusion rate of 7 PRBC (range 0 – 44)[3] units perioperatively.

CONCLUSION

This study states that blood conservation techniques (pre-operative embolisation, Hypotensive anaesthesia, Intra-operative surgical conservation, use of radio-frequency energy vessel sealing devices (LigaSure®, Valley Lab, Inc.,Boulder Colorado) and Computer Assisted Tumor Surgery (OrthoMAp 3D, Stryker Orthopaedics, Mahwah, NJ, USA) navigation have a definite role in reducing the intraoperative blood loss with improved outcome, reduced morbidity and mortality.

Figure 1: Case of large GCT in 24year male, super selective DSA angiogram of the feeding tumor vessel before embolization showing significant small feeding tumor vessels with tumor blush (figure 1a), post embolization with PVA particles there is drastic reduction in number offeeding tumor vessels and tumor blush

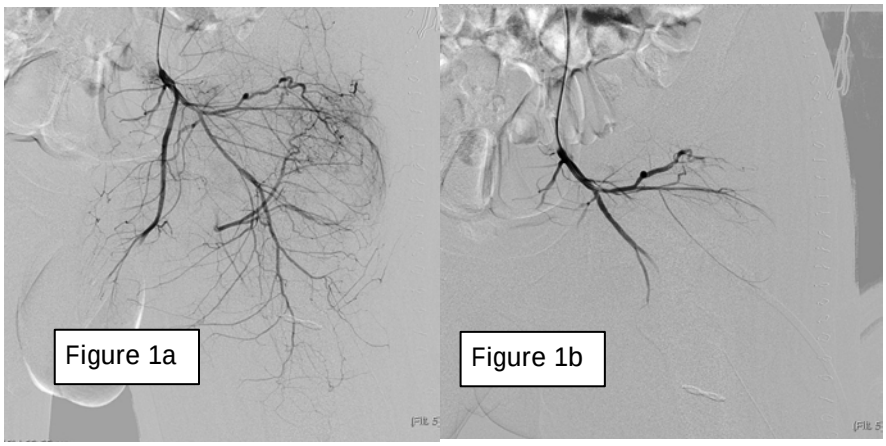

Figure 2.

Vessel Sealing device - Ligasure