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INTRA-AORTIC BALLOON OCCLUSION TO PREVENT BLEEDING IN PELVIC TUMOURS: A CASE CONTROL STUDY

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Background: Pelvic tumours surgery has been traditionally characterized by a high major complication rate and long surgical time. The advent of new resection techniques (intraoperative navigation) and reconstructive solutions (custom-made prosthesis) contributed to obtain better oncological and functional results and a reduction of surgical time. Bleeding has always been an issue in pelvic tumours surgery. Autologous blood donation or intraoperative blood recovery are usually not feasible in these patients. A high number of homologous blood units must be transfused to prevent blood dilution and multiorgan failure but this is not free from risks. Pre-operative solutions such as embolization or intra-operative anesthetic techniques such as hypotensive anesthesia have been used in orthopaedic oncology. A potential solution is intra-aortic balloon occlusion.

Questions/Purposes: The aim of the study was to evaluate the bleeding reduction intraoperatively and in the first 48 hours postoperatively and whether this could affect major complication rate, ICU and inpatient stay length.

Patients and Methods: From January 2014 to March 2015 we prospectively enrolled 5 patients (mean age 56,6 ys; mean surgical time 476 minutes) who underwent surgery for bone and soft tissue sarcomas in the pelvis and/or sacrum. This group (group 1) was compared with an analogous group (group 2) of patients for age, histology, anatomical site, type of resection and reconstruction (mean age 54,2 ys; mean surgical time 711 minutes) treated in the period 2009-2013 with data extrapolated by our database and clinical charts. Inclusion criteria: sacral tumours proximal to S3 and pelvic tumours (zone I, II, III) with an expected surgical time higher than 3 hours, sacral or pelvic tumours with wide involvement of intrapelvic organs and structures, intra-operative expected blood loss of more than 10 blood units (without any other bleeding prevention technique), pre-operative embolization not feasible for anatomical site or vascularization pattern. Exclusion criteria: local infection at the groin, chronic arterial occlusion disease, history of cardiac failure (NYHA III/IV), abdominal aorta (or distal) aneurism, congenital or acquired thrombophilic condition. Technique: an Equalizer Balloon Catheter (Boston Scientific, Ireland; 27 mm diameter, 65 cm length) was inserted under angiography guidance the day of planned surgery. Pulsossimetry on both feet was used to confirm the right position and functioning. Maximum occlusion time was 60 minutes with a 15 minutes interval before a second inflation. Intra-operative monitoring was conducted (IBP, ECG, SpO2, EtCO2, body temperature, Haemodinamic pulse contour parameters, pulsossimetry, urinary output). Blood loss, Sequential Organ Failure Assessment (SOFA) score, major complications incidence, ICU stay length, and overall inpatient stay length were compared in the two groups.

Results: The amount of blood transfused was 1300 ml in group 1 vs 6050 ml in group 2. The SOFA score was 5,4 at 24 hours and 1,8 at 48 hours compared to 8 at 24 hours and 4,2 at 48 hours in group 2. In group 1 we observed one major complication (intestinal subocclusion), while in group 2 we observed 3 local infections, 1 iliac DVT, 2 massive bleedings, 1 DIC, and 1 pleural effusion. The length of overall inpatient stay was 19,6 ± 7,2

days in group 1 while 63 ± 41 days in group 2. The mean length of ICU stay was 47,6 hours in group 1 and 66,6 hours in group 2.

Conclusions: This technique has already been used to limit blood loss and its efficacy was proven. [1-5] It is characterized by a low complication rate and a relative simple procedure of implant. The role of bleeding-preventing techniques in orthopaedic oncology is still not well defined because these tumours are rare and even more sarcomas in the pelvic and sacral region. It is mandatory to conduct multicentric studies to establish a guideline for the anesthesiological management of bone and soft tissue sarcomas.

References

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