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Editorial

Challenges in Interventional Radiological Procedures in Post-Partum Haemorrhage

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Interventional radiological (IR) procedures are increasingly being used as uterine preservation technique in setting of major obstetric haemorrhage. Advantages associated with interventional radiological procedures such as arterial occlusion and embolization are avoidance of major surgery/obstetric hysterectomy and its complications such as massive blood transfusion, coagulopathy, urinary tract injury, haemodynamic instability, delayed recovery, and shorter hospital stay; while preserving reproductive function. Prophylactic catheter placement and subsequent arterial embolization or balloon occlusion may decrease duration of surgery, overall blood loss, preserve the uterus, provides bloodless surgical field with less radiation exposure [1,2].

Delivery in women with placenta praevia and placenta accreta spectrum should be planned in late preterm (34 - 36wks), which provides optimal balance between fetal maturity and problems of unscheduled delivery [3]. ACOG committee opinion recommends patients with strong suggestion of abnormal placenta on prenatal ultrasound should be treated in a tertiary care centre; with a contingency plan for delivery with adequate blood bank support and 24 hours adequate availability of multispecialty personnel [4]. Larger studies are required to determine safety and efficacy of interventional radiological procedures in the routine management of patients with placenta accreta spectrum and placenta praevia.

Challenges for the anaesthesiologist [5,6]:

- **Distance from operation suites**: Transportation of the parturient between IR suite and operation theatre carries risk of sheath displacement with subsequent haemorrhage and also supine hypotension in absence of left uterine displacement (LUD) position.
- **Unfamiliarity with procedure and IR suite**: Selective institutes have facilities of well-equipped hybrid operating room to manage such obstetric emergencies. Anaesthesiologist and support personnel should be well versed with procedure along with its complications and IR suite to immediately respond with logistic, effective treatment plan within a crucial time frame.
- **Radiation exposure**: National Council on Radiation Protection has advised to keep exposure as low as reasonably achievable. Stochastic radiation effects can cause genetic mutation even at low radiation exposure associated with cancer risk later in life (0.4% risk per 10mGy exposure). Multiple strategies to minimize radiation exposure are use of ultrasound guidance for intervention, use of lead shielding, limiting fluoroscopy time along with use of pulsed fluoroscopy at the lowest pulse rates, use of last image hold to position patient, limiting the real time CT fluoroscopy, minimizing digital subtraction angiography and use of multi-detector CT.
- **Allergy to contrast agents**: Iodinated contrast (category B) administration should be followed by thyroid function test in neonate for first week. It is important to evaluate patient regarding history of allergy (previous life threatening reaction, episode of broncho-

spasm/asthma, hypotension, shock) as risk is increased by six-fold due to history of adverse effects, six to ten-fold by asthma, and to considerable extent by history of allergy to other drugs. Issue of proper informed consent and readiness to deal with emergency situation should be addressed.

- **Choice of anaesthesia**: Epidural anaesthesia is safe and effective as it avoids possible complications of general anaesthesia, facilitates placement of arterial sheath/occlusion catheter and allows conversion to surgical anaesthesia. Epidural catheter placement before arterial sheath or balloon occlusion catheter insertion is preferred as positioning for epidural can displace balloon/sheath and also to avert complications with use of heparin during procedure. Alternatively, interventional procedure can be performed under local anaesthesia followed by general anaesthesia for caesarean section to have better hemodynamic control in high risk cases [7]. Interventional procedure performed by experienced interventional Radiologist physician reduces radiation exposure, along with amount and duration of anaesthesia.

PPH is globally the leading cause of maternal morbidity and mortality. Early diagnosis and rapid intervention may significantly decrease haemorrhage related maternal morbidity and mortality. Every hospital should develop its own institutional protocols and algorithms to improve the outcome. MOH should be managed by a multidisciplinary approach in which inclusion of interventional radiologist also plays a significant role. Prophylactic radiological interventional procedures such as arterial balloon occlusion and selective artery embolization immediately before extraction of placenta may be of immense help to reduce intra-operative blood loss and postpartum haemostasis, ICU admission and prolonged stay in hospital in patients diagnosed with abnormal placenta [1,8]. These techniques and hybrid operative suites should be more widely available at hospitals catering to obstetric patients, to manage patients within a crucial time period and avoid possible complications of transportation like displacement of catheter and hypotension due to lack of lateral tilt from radiology suite to operative room [9]. Combination of good technical leadership, commitment, vigilance and an aggressive approach are key factors in ensuring the best possible outcomes.

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