Meeting the challenges in HIV patients undergoing robotic oncosurgery

Madam,

Immunosuppressive and inflammatory conditions such as acquired immunodeficiency syndrome (AIDS) are known to cause cancer progression.[1] Most common cause of human immunodeficiency virus (HIV)-related death in affluent societies is cancer[1] (especially AIDS-defining malignancies such as Kaposi's sarcoma, nonHodgkin lymphoma, and cervical cancer). Recent evidence implicates several perioperative factors (psychological stress, intraoperative hypothermia, allogenic blood transfusion, pain) for immunosuppression and cancer progression.[1,2] Radiotherapy and chemotherapy are cancer treatment modalities that may cause severe immunosuppression (thus cancer recurrence), while surgery appears the safer alternative. Surgery itself is known to stimulate neuroendocrine and cytokine stress response, suppress cell-mediated immunity, and disperse tumour "emboli." Robotic surgery is advantageous as it induces lesser inflammatory stress response than open surgery, and hence, theoretically reduces the chances of cancer progression.Robotic cancer surgery is a safe possibility for HIV patients in developing countries where economic limitations apply for disposables. The expensive nondisposable robotic instruments necessitate a stringent sterilization regimen before being reused. However, retropositive patients, being immunocompromised hosts, require special care or they may contract new infection which may lead to poor prognosis.

A 46-year-old male with squamous cell carcinoma of the tongue became HIV positive whilst undergoing a robotic surgery (hemiglossectomy with neck dissection).Here, we

share the principles followed in managing this patient for robotic surgery aimed at preventing HIV transmission and cancer recurrence.

Preanesthetic evaluation should screen for effectiveness and side effects of antiretroviral drugs (HAART) (our patient had elevated hepatic enzymes and CD4+ T-cell count of 624 cells/mm^3). Induction/inhibition of hepatic CYP 450 3A4 enzyme by HAART may prolong the effect of neuromuscular blockers, calcium channel blockers, fentanyl, midazolam, and cause lignocaine toxicity.[3] Protease inhibitors (saquinavir, ritonavir) increase the effect of sevoflurane, pethidine, dextropropoxyphene, amiodarone, and propofol. Etomidate, atracurium, desflurane, and remifentanil are not metabolized by CYP450, and hence, maybe preferred. Propofol possesses anticancer properties (attenuates cancer cell migration, proliferation, and metastasis *in vitro* besides inhibiting cycloxygenase).[4] Regional and local anesthesia attenuates immunosuppresion.[2,4] Neuraxial anesthesia concerns include, pre-existing peripheral neuropathy, and risk of HIV seeding of central nervous system (CNS) via a bloody tap. When surgical site precludes regional anesthesia, anesthetic technique should include induction and maintenance with propofol and infiltration of robotic neck dissection tunnel with local anesthetics. Nonimmunosuppressive, opioid-sparing drugs (nonsteroidal anti-inflammatory drugs, cycloxygenase–II inhibitors, ketorolac, gabapentin), systemic glucocorticoids, and β-blockers[2,4] merit preference. Succinylcholine poses risk of hyperkalemia in HIV-related myopathy and neuropathy patients. Volatile anesthetics, alpha 2 agonists (clonidine, dexmedetomidine), opioids, and blood transfusion are also known to cause immunosuppression and tumor recurrence.[2,4]

Transmission risk to staff mounts during invasive procedures and is minimized if universal precautions are universally followed. Needle stick injury carries a transmission risk of 0.03–0.3% depending on the type (hypodermic) of needle, depth of puncture, and quantity of blood inoculated.[3] Disposable equipment and linen, hydrophobic filter fitted circuits, visors, double gloves, and protective footwear should be utilized to avoid contact with blood, semen, cerebrospinal, pleural, pericardial, peritoneal, and amniotic fluids and tissues. Sweat, tears, saliva, sputum, urine, and stools are considered noninfectious unless contaminated by above.[3] Robotic endoscopic equipment tray is Gas plasma sterilized (STERRAD 100S) before reuse.[5] Robotic instruments are soaked in cold water or sprayed with pH-neutral enzymatic cleaner followed by an ultrasonic bath (performance ≥13 W/L; frequency ≥38 kHz; fully submerge; ≥1inch clearance from edges of bath).[5] The transparent robotic arm covers (costing 28000 INR per set) are disposable (but usually reused 3–4 times after ETO sterilization in developing countries). Because covers are discarded after surgery on HIV positive patients, covers already used 2–3 times previously provide economy.

Occupational Safety and Health Administration's blood borne pathogen standards,[6] offer three tiers of protection (Modification of tools with which we operate rather than attempting to change human behavior; work practice controls; personal protective equipment). Retractable lancets, blunt needles, guarded introducer needles, and programmed single use cannulae are safety innovations.

Robotic surgery may not only attenuate tumor progression but also reduces the surgeon's risk of contracting HIV from the patient. Anesthesiologists should stay updated about the possible long-term effect of anesthetic-analgesic techniques on the progression of cancer growth.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest.

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