

NARRATIVE REVIEW

An updated review on anesthesia and emergency medicine for forensic medicine practice

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Abstract

'Anesthesia' and 'Emergency Medicine' for 'Forensic Medicine' practice is an infrequently discussed topic in the current English literature. Demand of anesthesia and emergency medicine for forensic medical cases will probably increase in the future due to the ever-growing rate of drug trafficking and escalated sexual crimes at the regional as well as global levels. To address the relative scarcity of a review on this aspect, a comprehensive literature search was conducted using Cochrane, Medline, Scopus, and Google Scholar databases, to put forward the most up-to-date recommendations and guidance on the topic, which would shed light and help raise awareness among the emergency physicians, anesthetists, and intensivists about this important aspect of medical practice, ultimately improving the medical care of the affected ones without any prejudice and thus improve the outcome.

Key words: Anesthesia; Body packers; Body stuffers; Emergency Medicine; Forensic Medicine; Sexual abuse

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1. Introduction

The understanding of the importance and the implications of forensic medicine on anesthesia and emergency medicine is heavily inclined towards legal proceedings related to clinical care. Conversely, the important role played by the anesthetists and the emergency physicians in forensic medicine cases, both in acute and critical care, is discussed infrequently in an incoherent manner in the available English literature. The current local, regional and global trends of escalating sexual crimes and drug trafficking suggest that the expertise of these medical specialties will be sought more often with the passage of time.

2. Methodology

To fill this relative void of a comprehensive analysis, a narrative review was conducted using the Cochrane, Medline, Scopus, and Google Scholar databases. The terms 'anesthesia' AND/OR 'emergency medicine' AND 'forensic medicine' AND/OR 'body packers' AND/OR 'body stuffers' AND/OR 'sexual abuse' were

utilized during the literature search. Related data until April 2022 were gathered. Only the manuscripts composed in English were chosen for the review.

3. Review

Examination of a victim of sexual abuse is a necessity to elucidate the degree of trauma and identification of the perpetrator. Depending on the severity of the trauma, the victim might have to be resuscitated in instances of bleeding and pain, necessitating emergency medicine, anesthesia, and intensive care services.¹ Following initial stabilization, a complete physical examination is warranted. This is a sensitive procedure to be performed on a physically and psychologically distraught individual. Groups of victims such as pediatric and mentally subnormal, who might not cooperate, require sedation in order to conduct an effective examination. In the rest, active vaginal bleeding is considered the sole indication for sedation or general anesthesia by some authors.² In case sedation is required, a short-acting agent could be utilized. The victims should be treated

with a lot of compassion, empathy, and respect. Clear communication is of utmost importance and the concerns of the victim and the parents should be considered with care and addressed in detail. General anesthesia may be required in cases of extensive genital or other corporal injuries. The period of fasting and associated comorbidities should be clarified, the latter being important, especially for victims with congenital syndromes. The pelvic examination requires the informed consent of the victim or the guardian/parent. Similarly, written informed consent is a prerequisite for any form of anesthesia. When the pelvic examination is conducted under anesthesia for forensic purposes such as a part of the physical examination or to collect some samples, the consent for each component is mandatory. In some countries, state-wise modifications to pelvic examinations are legislated, allowing examinations under sedation or general anesthesia to be conducted without consent if the patient is unable to consent due to a long-term medical condition or if there is a risk of losing evidence in cases of sexual assault.

Drug trafficking has seen an unprecedented surge globally in the recent years.³ Similar trends have been observed in drug trafficking by internal concealment in own body cavities.⁴ Concurrently, Sri Lanka is becoming a transit hub for international drug trafficking.⁵ Despite the unavailability of comprehensive local data on internal drug traffickers except for a few case reports,⁶⁻⁷ these trends predict that more 'internal drug traffickers' will be presented to emergency care units, surgery, and intensive care in the future suggesting the importance of getting familiarized with terms utilized in internal drug trafficking. It is a sine qua non to have a thorough understanding of the physiological effects of common 'internally trafficked' drugs to decide the level of care and subsequent specific and supportive management which might be life-saving in this cohort where the majority represents young adults.⁴ Table 1 illustrates the nomenclature utilized.

The importance of recognizing these categories is multifactorial. The medical management of each category differs depending on the type of drug, the need for invasive procedures, and the presence of life-threatening emergencies. Symptoms, if present, might suggest potential complications including systemic absorption leading to drug intoxication or bowel obstruction or perforation.⁹⁻¹¹ Patients following intestinal complications might present with abdominal pain, vomiting, bleeding, and sepsis in cases of delayed presentation.¹² Drug intoxication could be life-threatening and had been fatal in a few cases.^{4,13} Symptomatology related to drug intoxication is determined by the type of drug. Cocaine, heroin, and cannabis are considered the commonest illicit drugs transported through body packing globally even though

Table 1: The nomenclature associated with internal drug trafficking⁸	
Terminology	Expanded version
Internal drug trafficking/ body packing	Concealment of illicit drugs inside the body by swallowing, placing in the anus or vagina
Body packers/mules	The individuals involved in body packing, usually carry large amounts of illicit drugs
Body stuffers/ mini body packers	conceal drugs wrapped in cling film in the mouth which might be spat out or swallowed to avoid detection by law enforcement officers, carry smaller amounts of drugs for immediate sale or self-use ⁴
Pushers	conceal drugs or objects such as mobile phones or sim cards, usually in containers such as "Kinder eggs", in their rectum or vagina, to avoid detection

regional disparities have been observed.¹⁴ Table 2 depicts possible clinical manifestations of drug intoxications.

A methodical, complete physical examination consisting of temperature, cardiovascular, respiratory, abdominal, and neurological systems is thus warranted in a suspected drug packer. In cases of ingestion of multiple

Table 2: Clinical features following illicit drug intoxications	
Illicit drug	Witnessed clinical features
Cocaine/ Methamphetamine	Stimulatory hypertension, tachycardia, tachyarrhythmia, agitation, focal neurological symptoms, mydriasis, diaphoresis, seizure, hyperthermia, and tremor, myocardial infarction, aortic dissection rhabdomyolysis
Heroin/opium	Depressant effects decreased level of consciousness, myosis, slow bowel movement, hypotension, bradycardia, and hypoventilation
Cannabis	Excitatory central nervous system symptoms, neurotoxicity, Palpitations, nausea

types of drugs, patients will present with a mixture of stimulatory or depressive features.¹⁵ Basic biochemical investigations, which include complete blood count, serum electrolytes, urea, and creatinine, liver enzymes, clotting studies, creatinine phosphokinase, and an electrocardiogram should be ordered. Radiological studies are required to confirm the drug packing and ascertain the location and number of the drug packets. Abdominal X-rays were found to have low sensitivity and specificity.⁸ Most recent guidelines recommend the use of abdominopelvic Low-Dose Computed Tomography (LDCT) with contrast, to counteract this issue where leakage and rupture of drug packets are also detectable.⁸ Repeat CT studies may be indicated during follow-up of the patients to look for any remaining drug containers.¹⁶ The consent of the patient is a necessity prior to LDCT.⁸ The use of ultrasound lacks clear evidence over LDCT or X-ray as interpretation depends on operator skill and experience.¹⁷

The management of the suspects depends on the category (body packer or stuffer) and symptoms on presentation. It might be useful to get additional details such as the suspected drug, quantity, and how it was stuffed or packed.⁸

Body stuffers

Asymptomatic body stuffers should be monitored for at least 8 hours following ingestion, as there can be delayed rupture and drug intoxication. Symptomatic patients should be managed according to suspected drug intoxication and released from medical care once symptoms are resolved.^{10–18,19}

Body packers

Symptomatic patients need urgent medical and if indicated surgical interventions. For patients suspected of having cocaine toxicity, an urgent surgical referral is recommended to evacuate drug packets.^{8,20} A LDCT should not delay surgical interventions. Endoscopic extraction is discouraged in recent guidelines due to the risk of rupture of the drug containers and worsening toxicity.⁸ In cases of suspected opiate toxicity, medical management is preferred with close monitoring. Asymptomatic body packers confirmed by LDCT can be monitored conservatively, surgical interventions reserved if drug packets do not move along the alimentary tract. Mildly symptomatic body packers with confirmed imaging can be subjected to whole bowel irrigation to promote expulsion of the drug packets using Isotonic laxative preparations such as Klean-Prep or Movicol (macrogols) in preference to hypertonic agents such as lactulose. The latter carries an increased risk of breakage of wrappings of drug containers and leakage.⁸ Prokinetic agents should be avoided due to the theoretical risk of rupture of containers facilitated by

peristalsis.¹³ Table 3 depicts specific and/or supportive medical management in common illicit drug intoxications.

Table 3: Medical management strategies for common illicit drug intoxications

Drug	Management
Cocaine	<p><i>Mainly supportive</i></p> <ul style="list-style-type: none"> ▪ Nitrates, sodium nitroprusside to control arterial hypertension (beta-blockers- controversial), alpha-beta blockers- approved ▪ Lignocaine for control of tachyarrhythmia ▪ Benzodiazepines for seizure control/ sedation if hyperadrenergic symptoms are present ▪ Cooling blankets for hyperthermia
Heroin/opium	<ul style="list-style-type: none"> ▪ Ventilatory and circulatory support ▪ Naloxone IV 2–5 mg at 5-minute intervals until resolution of symptoms or naloxone infusion
Cannabis	Supportive

Usually, body packers pass drug packets within 48 h through normal bowel motions.⁸ If not, a repeat LDCT is indicated to confirm clearance. Upon passage, the suspect can be discharged and handed over for further legal proceedings.

The surgical interventions are required in cases of suspected cocaine toxicity, persistent symptoms despite medical management in suspected opiate toxicity, bowel perforation, bleeding, and if the drug containers are not progressing through the bowel. The necessity of surgical evacuation in suspected cocaine toxicity is mainly due to the non-availability of a specific antidote.¹³ Gastrostomy following open laparotomy and milking is adopted for effective removal of body packets. In cases of extensive distribution across the alimentary tract, several enterotomies might be warranted.⁴

Symptomatic patients need admission to a high dependency unit for management. The clinical parameters should be closely monitored in view of early detection and treatment of life-threatening emergencies. In unfortunate cases of cardiac arrest, prolonged cardiopulmonary resuscitation is encouraged due to its potential recoverable nature without neurological deficits.⁸ Further, attempts at resuscitation should only be abandoned following consultation with a senior consultant.

On discharge from the emergency department or intensive care / high dependency care, details pertaining to the type of drug and number of drug containers recovered, and remaining should be handed over to police in a confidential manner. In the case of the latter, details on drug toxicity should be elaborated on to the receiving team.

4. Conclusion

Given the demographics of the patient cohorts (mainly young adults) presented for resuscitation, analgesia or clinical interventions, the anesthetists and emergency physicians must have a thorough understanding and appreciation of medical ethics and up-to-date knowledge on identifying and optimally managing related life threatening and potentially salvageable conditions such as haemorrhage, intestinal perforation and illicit drug toxicities related to forensic medicine. This narrative review discussed the up-to-date evidence and guidance on this important aspect. Further analysis of data in the future will definitely shed more light and direct the attention of the clinicians involved.

5. Conflict of Interests

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7. Authors' contribution

All the authors took part in concept, data collection, data analysis, and manuscript preparation

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