EDITOR'S CHOICE

Packers, pushers and stuffers—managing patients with concealed drugs in UK emergency departments: a clinical and medicolegal review

R J Booker,[1] J E Smith,[1,2] M P Rodger[3]

[1] Emergency Department, Derriford Hospital, Plymouth, UK; [2] Academic Department of Military Emergency Medicine, Royal Centre for Defence Medicine, Birmingham, UK; [3] Orthopaedic Department, Torbay Hospital Torquay, UK

Correspondence to: Captain R J Booker, Wardroom HMS Drake, Plymouth PL2 2BG, UK; rjbooker@doctors.org.uk

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ABSTRACT

Body packing, pushing and stuffing are methods by which illicit drugs may be carried within the human body. Patients involved in these practices may present UK emergency departments with complex medical, legal and ethical considerations. This review article examines not only the evidence behind the clinical management of these patients, but also the legal powers afforded to the authorities to authorise the use of intimate searches and diagnostic imaging for forensic purposes. Serious complications from concealed drug packets are now rare, and most asymptomatic patients may be safely discharged from hospital after assessment. Emergency surgery is indicated for body packers with cocaine poisoning and for some cases of heroin poisoning. Urgent surgery is indicated for obstruction, perforation, the passage of packet fragments and failure of conservative treatment. Guidance is given for doctors who are faced with requests from the authorities to perform intimate searches and diagnostic imaging for forensic purposes.

Concealment of illicit drugs may occur in a number of settings. Body packers swallow drugs in rubber or latex packets in an attempt to transport them across international borders without detection.[1] Body pushers insert drug packets into the rectum or vagina. The number and size of the packets may vary, but each one will usually contain many times the toxic dose of the drug, most commonly either cocaine or heroin. The sophistication of the packaging methods used by drug smuggling organisations results in a low morbidity to their "drug mules", although packet failure may still cause poisoning in the country of origin,[2] during flight,[3] or at their destination.[4] Body stuffers spontaneously swallow either unwrapped or poorly wrapped drugs when fearing apprehension by the authorities, in order to dispose of evidence and frustrate the legal process.[5] They are distinct from pushers and packers in the amount of drug and integrity of packaging used.

The Drugs Act 2005 gives additional powers to the police services of England and Wales to authorise imaging of suspected body packers. The aim of this article is to provide an evidence-based approach for the emergency department (ED) management of suspected body packers, pushers and stuffers, and to summarise the law relating to forensic imaging.

METHODS

A comprehensive literature search was carried out using the Datastar interface. Search terms included "body packing", "foreign bodies", "stomach", "heroin", "cocaine" and "drug". The databases interrogated were Medline (1950 to December 2006), CINAHL (1982 to January 2007) and EMBASE (1974 to January 2007). Papers were included if they contained original data regarding body packing. The bibliographies of relevant papers were examined and cross-referenced. Papers were critically appraised for the quality of evidence presented. The criteria used were relevance to the question asked and study design. Studies were preferred in accordance with the usual hierarchy of evidence, namely controlled clinical trials, prospective studies (including case–control studies) and case reports. Further information was obtained from Her Majesty's Revenue and Customs (HMRC) and from the Association of Chief Police Officers' National Drugs Coordination Office.

RESULTS

A total of 180 papers was found, of which 21 were directly relevant. Although there were no randomised trials, 10 case series were identified.[1 4–12] Only two case series reported on more than 100 cases; 581 cocaine body packers in France[6] and 572 suspected body packers in England.[1] Numerous other single and double case reports were found in both the biomedical and forensic science literature.

The largest case series was a retrospective review of 581 cocaine body packers detained at two Paris international airports from January 1999 to December 2002 and admitted to the Hôtel Dieu medicojudicial ED. A total of 573 experienced no complications and were discharged after 5 days' treatment with paraffin oil (50 ml 8-hourly) and an antispasmodic (trimebutine orally or intravenously). Eight were symptomatic and were admitted to the intensive care unit. Of these, six required surgery for the following indications: obstruction (two cases), poisoning (two cases) and suspicion of packet rupture (two cases).[6]

The next largest case series was a retrospective review of 572 suspected body packers brought to Ashford Hospital ED, located within 2 miles of London Heathrow international airport. A total of 536 was asymptomatic and were discharged from the ED to the care of HMRC officials, with limited further details recorded. Thirty-six were symptomatic and were treated in hospital with oral purgation; of these, seven required surgery for the following indications: obstruction (four cases), poisoning (two cases), failure to pass packets spontaneously (one case).[1] Both studies support

Table 1 McCarron and Wood[7] classification system for drug packets

	Type 1	Type 2	Type 3
Consistency	Loose powder	Matted powder	Rock-hard paste
Wrapping	Condoms, toy balloons	Multilayer tubular latex	
Ties	Bulky	Smooth	
x Ray appearance			
Shape	Round or cigar	Oblong	Not seen
Density	Radio-opaque or radiolucent	Radio-opaque	Not seen
Gas halos	None or irregular	Present and regular	Not seen
Ties	Not apparent or "rosette"	Not seen	
Hazard	Often break or leach	No reports of breaking or leaching	

conservative management in asymptomatic body packers, reporting low rates of both complications and progression to surgical treatment. There were no fatalities in either series.

Body stuffers are less well reported, the largest case series found being a retrospective review of 98 crack-cocaine body stuffers presenting to an ED in California, USA.[5] Serious complications following body stuffing are rare. When seizures do occur, it is likely to be within 2 h of ingestion, although there is a report of delayed seizures in a crack-cocaine body stuffer at 10–24 h post-ingestion.[13]

How may body packers, pushers and stuffers present to the ED?

The "body packer syndrome" arises when packet rupture results in poisoning, usually with cocaine or heroin. These patients may present unconscious, or with a history of collapse, seizure or abdominal pain. Body packers and pushers tend to present in the custody of HMRC officers. They are commonly men but may be women,[1] pregnant,[14] or even children.[15–17] Body stuffers tend to present in the company of police officers. Patients who have concealed drugs may also self-present with abdominal pain, bloating, vomiting or constipation or when the packets fail to pass spontaneously.

What are the key features of the history?

History from the patient may be unreliable, despite the fact that most body packers will know the number and contents of the packages they have concealed. Communication may be difficult due to language barriers or fear of prosecution. Cocaine body packers intercepted in the UK have usually boarded flights from west African countries such as Ghana. Following successful counter-smuggling operations against traditional routes from the Caribbean, the number of detected cocaine body packers arriving in the UK from Jamaica fell from 730 in 2002 to only five in 2006. Heroin body packing is rare in the UK, as the drug is usually imported in vehicles driven into the country from the Balkan states, following processing in Turkey and cultivation in Afghanistan.[18] The total quantity of drug swallowed may be up to 2 kg divided into as many as 200 packets.[19] Details of the packaging method are important. Improvised packets constructed from condoms, balloons or fingers of latex gloves are more likely to rupture or leak than machine-produced packets in multiple layers of latex, which are durable and likely to pass through the body intact. McCarron and Wood[7] identified three types of drug packets (see table 1). de Prost *et al*,[6] in a series of 581 body packers, found that type 1 packets were rare (prevalence 9%), but were strongly associated with complications, being present in five of the eight patients (prevalence 62.5%) who required admission to the intensive therapy unit for complications including poisoning and obstruction. A drug history may reveal drug dependence or co-ingestion of constipating agents to prevent premature passage of the deadly cargo.

How helpful is clinical examination?

In the acutely unwell patient with "body packer syndrome" the toxidrome should be readily identifiable, although mixed cocaine and heroin body packing has been reported.[20] Cocaine may cause agitation, sweating, dilated pupils, hyperthermia, tachycardia and hypertension. More serious effects may include seizures, status epilepticus, myocardial infarction and ventricular fibrillation. Heroin may cause a reduced level of consciousness, respiratory depression, pinpoint pupils and decreased bowel sounds. Rectal and vaginal examination may reveal drug packets that should be promptly removed with suction and copious irrigation to minimise poisoning in the event of rupture.

In the asymptomatic patient examination is usually unhelpful, although packets may be detected by careful abdominal, vaginal or rectal palpation. Vaginal drug packets are no less dangerous, and have led to death due to rupture and systemic absorption.[21] They may require obstetric forceps for removal.[22] Only the forensic physician should perform intimate body searches (see table 2).[23]

A urinary drug screen is of limited value. de Prost *et al*[6] found that 91 of 175 cocaine body packers tested positive for cocaine on urine testing (sensitivity of 52%). Furthermore, a positive test may arise from contaminated outer packets, semipermeable wrappings, or from recreational use. Following an initial negative test, serial testing may be useful to detect packet breakdown and impending poisoning.

How effective is diagnostic imaging in detecting drug packets?

There is no gold standard test for detecting concealed drug packets. The detection rate will increase with the number ingested and experience of the reporting clinician. On abdominal *x* ray, drug packets may be visualised as oval or round soft tissue densities highlighted by a gas halo arising either from gas trapped in the wrapping material during manufacture, or

Table 2 Schedule for intimate body searches

Body area	Type of search
Mouth	Visual inspection with light source
Nostrils	Visual inspection with auroscope
Ears	Visual inspection with auroscope
Umbilicus	Visual inspection with light source
Foreskin	Visual inspection with light source
Rectum	Digital exploration with or without proctoscopy
Vagina	Digital exploration with or without speculum inspection of vaginal fornices

fermentation within the drug packet. McCarron and Wood[7] type 1 drug packets may be more visible due to greater amounts of air being trapped between layers of wrapping (the "double condom" sign) or in knots (the "rosette" sign).[24] The sensitivity of abdominal *x* ray in the detection of drug packets in body packers is reported as 47–95%.[7 25–27] Supine radiographs provide superior images to erect.[28] False positives may occur with constipation arising from not only an opiate cargo, but also the co-ingestion of antimotility drugs. The performance of *x* ray may be enhanced by repeat imaging and the use of oral contrast,[29] although no comparative studies were found. The false negative rate is difficult to quantify, as in many studies a negative *x* ray resulted in the release of the detainee. McCarron and Wood[7] reported a false negative *x* ray in 16 of 48 body packers. *x* Ray is an unhelpful investigation for most body stuffers as the small quantities of drugs involved are not visualised.[5]

The role of ultrasound in detecting drug packets has a very limited evidence base. One prospective study of 12 people found that both abdominal *x* ray and ultrasound correctly identified the seven subjects with ingested sham drug packets and the five subjects who had not ingested sham drug packets.[30] As ultrasound becomes more available in the ED, this may become a more useful investigation in the future.

The performance of computed tomography (CT) in detecting drug packets has been proposed as superior to *x* ray,[27] although there is little evidence to support this assertion. One case report described a heroin packet impacted in the mid-jejenum of a body packer that was not visible on abdominal *x* ray but was seen on CT.[31] Detection is improved by viewing at lung settings (window width 1000 Hounsefield units (HU), window level −700 HU) in addition to the usual abdominal CT settings (window width 350 HU, window level 50 HU). Equally, there are also case reports of false negative CT.[32]

How should asymptomatic patients be managed?

The majority of patients with concealed drugs in the UK can be managed conservatively, with a complication rate of less than 5%,[1 6] although clinicians must remain alert to the complications that may prove fatal if undetected. A list of risk factors for developing complications is given in box 1, although it is not exhaustive. Suspected body packers at low risk of complications may be discharged and managed within a suitable facility. For example, London Heathrow airport has a custody facility with a perspex toilet complete with gloved inspection port where faeces from suspected body packers may be inspected for potential evidence.[18] Whole bowel irrigation with oral polyethylene glycol (PEG) was used in a small retrospective case series of 16 mixed cocaine/heroin body packers with no higher complication frequency than other methods.[20] PEG may reduce cocaine toxicity not only by accelerating its removal from the colon, but also due to its relatively high pH increasing the metabolism of cocaine to its inactive form, benzoylecgonine. Conversely, PEG may increase heroin toxicity by increasing its solubility. However, compliance with oral PEG is likely to be poor due to the unpleasant taste, and no comparative studies were found. No evidence was found to support the routine use of whole bowel irrigation.

Box 1 Risk factors for complications associated with concealed drugs

- Abdominal pain
- Vomiting
- Poisoning
- Improvised/home-made packaging (McCarron and Wood[7] type 1 packets)
- Large total quantity of drug (especially for body stuffers)
- High number of packets (>50)
- Large size of packets
- Delayed passage of drug packets (>48 h)
- Passage of fragments of packaging in stool
- Poisoning in a co-transporter
- Previous abdominal surgery (greater risk of obstructing secondary to adhesions)
- Concomitant drug usage, especially constipating agents
- Abnormal vital signs
- Positive urine drug test following previous negative test (may herald packet breakdown or rupture)

The routine use of purgatives for asymptomatic body packers who are not constipated is not recommended. However, mild oral laxatives (eg, senna, lactulose) may be given. The role of activated charcoal has not been defined, but this may be considered in those at risk of packet rupture. We propose that patients presenting to a UK ED with a history of concealed drugs who are asymptomatic at 6 h are at low risk of complications and should not usually require hospital admission.

How should symptomatic patients be managed?

Cocaine poisoning should be treated with intravenous benzodiazepines. Hyperthermia may require external cooling and paralysis. Hypertension may require additional treatment with drugs such as phentolamine or nitrates. Beta-blockers are contra-indicated as the unopposed α-stimulation leads to uncontrolled hypertension.[15] Surgical removal of the drug packets will often be required. Heroin poisoning should be treated with naloxone titrated to effect followed by a continuous infusion at two-thirds of the bolus dose per hour. Surgical removal of drug packets may be required if there is a poor response to naloxone.

The preferred surgical approach is laparotomy, with drug packets being retrieved through either enterotomies or transanally, or a combination of both techniques. With either approach the drug packets may be carefully "milked" through the bowel to avoid rupture and minimise the risk of infection associated with multiple enterotomies.[9]

What are the powers given to the police and HMRC to conduct intimate searches and forensic imaging?

The Drugs Act 2005[33] amended the Criminal Justice Act[34] and the Police and Criminal Evidence (PACE) Acts of England and Wales[35] and Northern Ireland.[36] Some of the amendments empowered the police, subject to a number of restrictions, to authorise intimate searches, *x* rays and ultrasound scans of persons suspected of having concealed class A drugs with the intention to supply another or export.[37] See table 3 for the classification of illicit drugs in the UK. In Scotland, a Sherriff's warrant may authorise an intimate search: "…in the interests of justice and to obtain evidence."[38–40]

Intimate searches

An intimate search is an examination of body orifices other than the mouth. Such a search must be authorised by an officer of Inspector rank or above (Superintendant in Northern Ireland),

and only when it is suspected that a detainee may have concealed: "(i) anything which they could and might use to cause physical injury to themselves or others at the station; or (ii) a class A drug which they intended to supply to another or to export".[37]

Furthermore, an intimate search must be believed to be the only way of removing the item(s). There is an important distinction between intimate searches conducted under section (ii) (drug offence searches), which require the consent of the detainee, and intimate searches conducted under section (i), which do not. The detainee must give written consent in order to have an intimate drug offence search under section (ii) and the police should deliver an appropriate warning: "You do not have to allow yourself to be searched, but I must warn you that if you refuse without good cause, your refusal may harm your case if it comes to trial."[37]

Intimate searches must be carried out by a registered medical practitioner or nurse, unless an officer of at least Inspector rank considers this is not practical and the search is to be conducted under section (i), in which case a police officer may perform the search. Searches under section (i) are considered only as a "last resort" and when the authorising officer is satisfied that the risks of allowing the item to remain with the detainee outweigh the risks of removing it.[37]

It has been reported that police officers have attempted to use section (i) of the legislation to authorise an intimate search for drugs, on the grounds that concealed drugs are an object that may cause harm to the person concealing them.[38] Use of section (i) rather than section (ii) could also be interpreted as permitting a police officer to conduct an intimate search for drugs were the forensic physician to refuse. The British Medical Association and the Faculty of Forensic and Legal Medicine consider this practice to be: "…totally unacceptable, dangerous, and a misuse of the legislation."[38]

Forensic imaging

The Drugs Act provides for a detainee to have an *x* ray or ultrasound carried out if he is "…suspected of having swallowed a class A drug and was in possession of it with appropriate criminal intention before his arrest".[33] The imaging must be authorised by an officer of Inspector rank, or above (Superintendant in Northern Ireland), and must be performed by a registered medical practitioner or nurse and be carried out at a hospital, a doctor's surgery, or other medical premises.[37] In warning a detainee before asking their consent for *x* ray or ultrasound, police should deliver an appropriate warning: "You do not have to allow an *x* ray of you to be taken or an ultrasound scan to be carried out on you, but I must warn you that if you refuse without good cause, your refusal might harm your case if it comes to trial."[37]

The police have no powers to authorise investigations other than *x* ray or ultrasound. They are required to report information relating to the numbers and outcomes of such investigations annually, although on request there were no current data available for analysis. HMRC officers have similar powers to the police to authorise intimate searches, but have no powers to authorise the use of forensic imaging.[38]

Table 3 Legal classification of drugs in the UK

Class A	Class B	Class C
LSD	Pholcodeine	Ketamine
Heroin	Amphetamine	Cannabis*
Cocaine	Methylphenidate (Ritalin)	Tranquillisers
Methodone		Gamma-hydroxybutyrate
MDMA (ecstasy)		
Injectable amphetamine		
Magic mushrooms (containing psilocin)		

*Following a recommendation from the Home Secretary, cannabis is likely to be reclassified a class B drug from 2009.[40] LSD, lysergic diethylamide; MDMA, *N*-methyl-L-(3, 4-methylene-dioxyphenyl)-2-amino-propane.

What involvement should the emergency physician have with requests for intimate searches and forensic imaging?

Requests for intimate searches and forensic imaging should usually be directed to the forensic physician and not involve the ED, in a similar fashion to the collection of blood-alcohol samples from suspected drink-drivers. A full discussion of the ethical and legal issues within this area of medical practice is beyond the scope of this article, and the interested reader is directed to the 2007 guidelines published by the British Medical Association and the Faculty of Forensic and Legal Medicine, which state that: "A fundamental ethical principle guiding medical practice is that no examination, diagnosis or treatment of a competent adult should be taken without the person's consent. The ethical obligation to seek consent applies even where this is not a legal requirement."[38]

It is possible that the suitably trained emergency physician may choose to become a contracted forensic physician. If so it must be made clear to all parties whether they are attending patients in a therapeutic, forensic or dual role. The forensic physician should attend whenever an intimate search or forensic imaging is proposed so that they can explain what is involved to the detainee and establish the validity of his consent regarding the search and/or forensic imaging. The doctor should be aware of the numerous factors that may compromise the ability of the detainee to give consent and ensure that they have taken these into account.[38] The doctor should inform the detainee of the possible consequences of their options.[38] If consent is withheld then it is important to document the reason for refusal, which may, if the case comes to trial, be relevant in determining whether the detainee had a good cause for refusing.[37] Rarely, there may be circumstances in which an intimate search may be performed when the detainee had previously withheld consent, for example if they were to collapse and there were reasonable grounds to suspect that they may be poisoned from concealed drugs. In this instance an intimate search would be permitted, in order to save their life, rather than to gather evidence.[38] It is important to note that intimate searches conducted under section (ii) (drug searches) must be conducted by a registered medical practitioner or nurse (not a police officer) and must be performed at a hospital, doctor's surgery, or other medical premises (not a police station).[37]

When *x* rays or ultrasound are requested, we propose that the forensic physician should advise the police of the limitations of diagnostic imaging, in particular that a negative scan or *x* ray does not exclude the carriage of concealed drugs, and that a positive scan or *x* ray may occur in the absence of concealed drugs. The most reliable way of obtaining evidence will be when it leaves the body. In the absence of toxicity or obstruction, the majority of detainees may be safely discharged into police or HMRC custody for this to occur. In certain circumstances the police are able to detain people for up to 28 days, which should be sufficient for concealed drug packets to re-emerge. However, this strategy may be less useful if drug packets are secreted in the vagina, where an intimate search or imaging may prove

useful. Detainees who are pregnant or potentially pregnant should not be exposed to ionising radiation. Therefore, abdominal *x* ray should be avoided in the second half of the menstrual cycle in case conception has occurred.[38] The detainee may choose to consent to ultrasound, but not *x* ray. In all cases it is essential that the valid consent of the detainee is obtained and documented if the forensic physician is to carry out an intimate search or arrange forensic imaging. If the detainee refuses to consent to a search or imaging, then the doctor involved must withdraw from further involvement. On leaving medical care, the detainee and any accompanying police or HMRC officers should be advised to seek urgent medical review in the event of poisoning, obstruction, or other symptoms.

CONCLUSION

Serious complications from the internal concealment of drugs are now fortunately rare. However, the diagnosis of body packer syndrome should be considered in any acutely unwell international traveller or detained person, especially when associated with unconsciousness, collapse, seizure or gastrointestinal symptoms. Emergency surgery is indicated for body packers with cocaine poisoning and for some cases of heroin poisoning. Urgent surgery is indicated for obstruction, perforation, the passage of packet fragments and failure of conservative treatment. However, the majority of patients who have concealed drugs within their body will not require medical intervention. Body stuffers or packers who have no risk factors for complications and are asymptomatic at 6 h post-ingestion may be safely discharged from hospital with instructions to seek further medical advice if they become unwell. Requests for forensic imaging should be directed to the forensic physician. ED close to ports of entry into the UK may wish to liase with HMRC, their local police service and forensic physicians to assist in the appropriate management of detainees suspected of concealing class A drugs and to avoid unnecessary ED attendances.

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