

Clinical management of cocaine body packers: the Hillingdon experience

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Background: International smuggling of cocaine by internal concealment is a serious and growing problem. People who engage in this practice are commonly referred to as body packers or mules. The most serious risks associated with body packing include intestinal obstruction and death from cocaine intoxication. These patients were previously managed primarily by surgical retrieval. This was associated with significant mortality due to rupture of poorly constructed cocaine packages. More recently, conservative management using whole bowel irrigation with polyethylene-glycol (Klean-prep Norgine) has been shown to be safe for most patients. To date, however, a consistent approach for the management of these patients has not been established.

Methods: We retrospectively reviewed the case notes, prescription charts and radiological investigations of all body packers admitted to our unit between 2000 and 2005, concentrating on initial management, complications and outcome.

Results: We identified 61 patients for inclusion. Of these, 56 were managed conservatively with a selection of aperients and laxatives. Six patients were treated successfully for cocaine toxicity and 5 required surgical retrieval of cocaine packets.

Conclusion: Our results confirm the safety of a conservative approach. Based on our experience and a review of the literature, we have devised a treatment protocol to reduce the risk of complications and the length of stay in hospital.

Contexte : La contrebande internationale de cocaïne par dissimulation à l'intérieur du corps constitue un problème sérieux et croissant. On appelle couramment « passeurs » ou « mules » les personnes qui se livrent à cette pratique. Les risques les plus sérieux associés au transport interne comprennent l'occlusion intestinale et la mort par intoxication à la cocaïne. On traitait auparavant ces patients principalement par extraction chirurgicale. L'intervention était associée à une mortalité élevée à cause de la rupture des emballages de cocaïne de mauvaise facture. Plus récemment, on a démontré qu'un traitement conservateur consistant à irriguer tout l'intestin au polyéthylène-glycol (Klean-prep Norgine) était sécuritaire pour la plupart des patients. Jusqu'à maintenant, on n'a pas établi de façon uniforme de traiter ces patients.

Méthodes : Nous avons étudié rétrospectivement les notes de cas, les tableaux d'ordonnance et les examens radiologiques de tous les passeurs admis dans notre service entre 2000 et 2005, en nous concentrant sur le traitement initial, les complications et l'issue.

Résultats : Nous avons trouvé 61 patients à inclure à l'étude, dont 56 ont été traités de façon conservatrice par un éventail de laxatifs. Six patients ont été traités avec succès contre une intoxication à la cocaïne et dans 5 cas, il a fallu extraire chirurgicalement les emballages de cocaïne.

Conclusion : Nos résultats confirment la sécurité d'une approche conservatrice. En nous fondant sur notre expérience et sur une recension des écrits, nous avons conçu un protocole de traitement pour réduire le risque de complication et la durée du séjour à l'hôpital.

Internal concealment is a widespread method of illegally transporting cocaine and other narcotics across borders. People who engage in this practice are commonly known as body packers or mules.¹ An increasingly frequent surgical referral from accident and emergency departments in hospitals situated near ports of entry to the United Kingdom is the symptomatic cocaine packer.² Each ingested packet usually contains 3–15 g of cocaine.^{1,3} In exchange for a fraction of the street value of the drugs they are carrying, body packers risk imprisonment, surgical complications and death from massive drug exposure

following packet rupture.^{4,5} Until now, these patients were primarily managed by surgical retrieval, associated with substantial morbidity and mortality.^{1,6} More recently, however, a conservative approach has been shown to be safe.⁷⁻⁹

We sought to review the management and complications of these patients to design a treatment protocol ensuring optimal care and ease of future audit.

METHODS

We performed a retrospective observational study of the management of this group of high-risk patients at Hillingdon Hospital during a 5-year period between January 2000 and January 2005. The hospital is situated 4 miles from Heathrow airport (the largest in Europe, serving 185 000 passengers each day). During the study period, a total of 2508 suspected body packers were detained at Heathrow, 590 (23.5%) of whom were subsequently referred to hospital for further investigation, observation or treatment. A total of 351 (59.5%) of those referred to hospital had visible cocaine packets on plain abdominal radiographs obtained in the accident and emergency department. Most (75.8%) of these confirmed body packers then returned to Heathrow, as they were judged to be suitable for observation and conservative management at the airport detention centre. A total of 85 body packers required hospital admission during the 5-year study period and, of those, most were admitted to Hillingdon Hospital. We gathered patient information using hospital admission codes, medical notes, drug prescription charts and radiology imaging.

We designed a treatment protocol using data from our experience and outcomes and the best available evidence from the literature.

RESULTS

A total of 61 body packers (43 men, 18 women, mean age 35.6 yr) were admitted to our unit during the study period. The patients had all been arrested at Heathrow airport, most commonly on arrival from Jamaica (53%). Other ports of origin included Trinidad (5) and Venezuela (4); however, in several cases, the location was not documented. All were accompanied by 3 of Her Majesty's Customs and Excise staff. The most common reason for admission to hospital was abdominal pain; only 4 patients (6.6%) presented with symptoms of cocaine toxicity. The mean number of cocaine packets swallowed was 70 (range 3-169). Most patients had no clinically important comorbidities. Physical examination was unremarkable in 81% of patients. Other findings on examination were abdominal tenderness without evidence of peritonism, and 1 patient had an incarcerated inguinal hernia.

All patients but 1, who was found to be 12 weeks pregnant on admission, underwent initial investigations, includ-

ing baseline blood tests (full blood count, urea and electrolytes, liver function tests and C-reactive protein), an electrocardiogram (ECG) and plain abdominal radiograph. Five patients had urine samples that tested positive for cocaine, whereas the rest were not tested.

All patients were admitted to a general surgical ward, with clinical observations recorded regularly. Most (91.8%) patients received conservative treatment. We used a variety of medications to clear the bowel of ingested cocaine packages (Table 1). Permitted oral intake varied according to clinical state. Patients without bowel obstruction were allowed free fluids or a light or normal diet; however, those with suspected or confirmed bowel obstruction received no food or drink orally and remained on intravenous replacement until they began passing stools or underwent surgery. Customs staff counted and secured the obtained packets. At no point during the conservatively managed patients' stays were hospital staff involved in the handling of cocaine packets because the laws regarding the handling of evidence require a secure chain of custody to guarantee the identity and integrity of the specimen, from collection through to reporting of the test results.¹⁰ In most cases, we were therefore unable to obtain first-hand information regarding the type of packaging used or the patients' conditions after passage.

Six patients showed clinical signs of cocaine toxicity. Of these, 4 presented with symptoms and the remaining 2 became unwell during their stays in hospital (Table 2). Three received conservative management with cardiac monitoring and referral for a medical opinion. The other 3 patients' symptoms failed to resolve with conservative measures, and we retrieved the cocaine packets surgically. Five patients underwent emergency surgery (Table 3). The indications for surgery in these patients were unresolving symptoms of cocaine toxicity in the 3 previously mentioned patients, unresolving bowel obstruction in 1 patient and an incarcerated hernia that was obstructing the passage of packets in 1 patient. Elective surgery was not requested by or offered to any of the patients. There were no recorded deaths in the study group.

Table 1. Summary of the agents used to clear cocaine packets from the bowel in 61 patients admitted to Hillingdon Hospital between January 2000 and January 2005

Medication	Frequency, %*
Senna	9.8
Lactulose	21.3
Picolax	50.8
Klean-prep	32.8
Phosphate enema	1.3
Glycerin suppositories	0.6

*Combinations of preparations were also used therefore the total is > 100%.

The average duration of admission was 2.8 days for patients managed conservatively and 10.4 days for those who had a surgical intervention. Seven patients were released as soon as their presenting symptoms had resolved, even if they had not passed all the packets. The remaining patients were discharged when they were deemed to have passed all packets, as assessed either by stool examination, radiology or both.

DISCUSSION

International smuggling of cocaine via body packers is an increasingly common problem.⁸ This practice is associated with a potentially significant risk of morbidity and mortality.¹¹ During the study period, referral to hospital for assessment was necessary in 590 (23.5%) of 2508 suspected body packers detained at Heathrow. However, most (75.8%) of those referred did not warrant admission. In fact only 3% of the body packers detained during the study period required inpatient treatment. We have now highlighted several areas of importance to ensure safe conservative management.

According to McCarron and Wood's classification,¹ packets may be described as type I (thinly wrapped with rough knots), type II (medium quality with thin knots) and type III (an internal aluminum sheet and several latex coats closed with surgical type ligatures). Risk of packet rupture is thought to be high, low or very low, respectively.¹² This has obvious implications for the choice of care setting, the likelihood of toxicity and the risk for surgical intervention. Recent reports, however, suggest that packages are now increasingly well crafted, probably via an automated process, making them far less susceptible to rupturing,¹³ and this view is supported by our results. Baseline observations of temperature, blood pressure, pulse rate, respiratory rate and pulse oximetry should be obtained. Asymptomatic

patients often have a normal initial examination, but it is important to look for signs of cocaine intoxication.

Patients frequently present reporting abdominal pain, but evidence of peritonism on admission is rarely reported.¹⁴ Physical examination should include a check for abdominal scars, herniae, signs of intestinal obstruction and a search of the vagina or rectum for packages concealed there.¹⁵

Blood tests, including full blood count, urea and electrolytes, and liver function tests should be requested. Although they rarely contribute much to the diagnosis, it is important to have baseline values should the patient's condition subsequently deteriorate.¹⁶ An ECG should also be performed to detect any arrhythmias or evidence of cardiac ischemia.¹⁷

As an initial screening investigation, the use of enzyme immunoassay testing of urine for cocaine metabolites, is controversial.¹⁸ This test was performed in 5 (8%) of our patients and did not contribute to their management. A recent study by Bogusz and colleagues¹⁹ using the EMIT cocaine metabolite assay was positive in only 11 of 30 urine samples from patients with positive abdominal radiographs. The high false-negative rate suggests urinalysis alone may be insufficient to confirm the diagnosis.

Plain abdominal radiography is the most commonly employed investigation and was performed on all but 1 of our patients, who was found to be 12 weeks pregnant on admission. A review of the accuracy of plain abdominal radiographs in the identification of body packers concluded that, although specificity is high (97%) and a positive finding is diagnostic, a single abdominal radiograph is insufficiently sensitive to exclude abdominal drug carriage.²⁰

In our opinion, the objective of treatment is to induce gut clearance of cocaine packets in as short a time as possible without causing any physiologic upset. Over the years, a wide range of laxatives and promotility agents have been

Table 2. Summary of specific patients who exhibited signs of cocaine toxicity

Patient no.	Sex	Symptoms	Management	Outcome
1	M	Hypertension 230/140, metabolic acidosis (BE -4.7)	Laparotomy	100 packets milked to anal canal
2	F	Agitation, sinus tachycardia	Diazepam, cardiac monitor	Symptoms resolved
3	M	Chest pain, sinus tachycardia	Cardiac monitor	Symptoms resolved
4	M	Chest pain, ST segment elevation in V2 on ECG	Medical registrar review, noncardiac chest pain	Symptoms resolved
5	M	Chest pain, ST segment elevation in V1+2 on ECG	Manual evacuation under general anesthesia	Packets removed; symptoms resolved
6	M	Violent behaviour, grand mal seizure	Diazepam, laparotomy	81 packets removed via gastrostomy

BE = base excess; ECG = electrocardiogram; F = female; M = male; V = chest lead.

Table 3. Summary of patients undergoing surgical intervention

Patient no.	Indication	Findings	Procedure	Outcome
1	Small bowel obstruction	Dilated small bowel, packets in stomach and mid-small bowel	Gastrostomy and enterotomy	23 packets recovered
2	Strangulated right inguinal hernia	Multiple packets in transverse colon with a single perforation	Colotomy, loop colostomy and right inguinal hernia repair	40 packets recovered
3	Cocaine toxicity	Multiple packets in rectum	Manual evacuation under general anesthesia	All packets removed, symptoms resolved
4	Cocaine toxicity	Multiple packets in stomach, first and fourth part of duodenum	Gastrostomy	81 packs recovered
5	Cocaine toxicity	Multiple packets in large bowel	Packets milked to anal canal	100 packets subsequently passed on ward

used to stimulate gastrointestinal transit of cocaine packets. Liquid paraffin was previously used but is now contraindicated as it can cause deterioration of latex-based packets.^{21,22} The current treatment of choice is whole bowel irrigation (WBI) with polyethylene-glycol (Klean-prep) at a rate of 1.5 L/h orally, until all packets are passed. There is no limit on the volume that can be given; however, there are some situations in which WBI is contraindicated. Examples include the presence of bowel obstruction, bowel perforation, clinically important gastrointestinal hemorrhage, hemodynamic instability and an unprotected compromised airway. Whereas some authors have found the digestive tolerance of Klean-prep to be poor in other situations, the drug has proven to be safe and effective for this indication and does not have any adverse effects on the patient's fluid balance or electrolyte status.^{7,13,22,23} In addition, it has been suggested that the need for a colostomy may be reduced in some patients managed with WBI who subsequently proceed to surgery.¹¹ In our study, 7 patients were managed with this regimen. Of the 7, only 2 received the drug at the recommended rate. The average volume given was 6 L per day. The common limiting factor was the patients' refusal to consume the large volumes of fluid required. Despite this, the average duration of stay was 2.1 days for patients managed solely with Klean-prep compared with 2.8 days for patients conservatively managed with a mixture of aperients and laxatives. Hoffman and colleagues⁷ suggest that administration of Klean-prep via nasogastric tube is as effective as taking the medication orally. This may still be difficult in noncooperative patients or those who do not comply with the oral route.

The absolute indications for surgery in our group were persisting signs or symptoms of cocaine intoxication or evidence of bowel obstruction. This is in keeping with the findings of several previous studies.^{11,12} Within our cohort of 61 admitted patients, 5% required surgical intervention. In 2 of them, this was entirely predictable: the first owing to an incarcerated inguinal hernia and the second owing to non-progression of the packets beyond the stomach after 5 days. If we assume an average need for surgery of 8% among patients admitted to hospital, this extrapolates to an overall rate of surgical intervention of only 0.3% among all detainees.

Opinions differ regarding the best approach to the conduct of surgery. In most published series, patients who have undergone laparotomy have had all identified packages removed.²⁴ East²⁵ presented 17 cases observed over 18 years. He suggested that obstructing packets encountered in the colon should be removed, whereas nonobstructing, unruptured packets may safely be allowed to pass spontaneously. A recent review of surgical interventions in cocaine packers over 15 years by Silverberg and colleagues²⁶ ($n = 25$), however, advised milking of the packets and their retrieval through the anus or enterotomy site. We recommend that, if possible, all packets be removed at surgery, as postoperative ileus would prolong the duration

of the packets residing in the gastrointestinal tract, increasing the risk of rupture.

Previous studies have reported delayed rupture of retained packages, which often resulted in death from cocaine intoxication.^{5,27-29} Most authors therefore advise that symptomatic patients who are admitted to hospital should remain there until they have passed all of the ingested packets, and/or at least 2-3 package-free stools followed by radiological confirmation of bowel clearance.¹¹ We advocate strict use of the following discharge

Box 1. Hillingdon Hospital body packer management protocol

History

No. of packets/type of packets _____
 Other agents taken? _ Y _ N
 Gastrointestinal symptoms _____

Investigations (results must be documented)

Electrocardiogram _____
 Blood tests _____
 Erect chest radiograph _____
 Abdominal radiograph _____

Management

Asymptomatic patients

- Admit to general surgical ward
- 4 hourly observations of blood pressure/heart rate/respiratory rate/oxygen saturations/temperature
- Klean-prep 1.5 L/h oral/NGT until all packets passed (no maximum limit)
- Light/normal diet
- Intravenous access at all times
- Daily examination for signs of intoxication/bowel obstruction
- Customs staff to inform team of type of packaging used and any evidence of packet deterioration.

Signs of intoxication

Cardiovascular:
 _ chest pain _ tachycardia _ persistent hypertension
 _ arrhythmias _ cardiac arrest
 Neurological:
 _ agitation _ dilated pupils _ profuse sweating
 _ hyperthermia _ seizures _ coma

Patients with any of the above symptoms should be resuscitated appropriately and reviewed by the on-call medical and surgical registrars.

Signs of obstruction

_ Nausea and vomiting
 _ Increasing abdominal pain and or distension
 _ Failure to pass packets and or flatus
 _ Distended bowel loops on plain abdominal radiograph

Patients with any of the above symptoms should be reviewed by the on-call surgical registrar.

Discharge criteria (all must be fulfilled)

_ The patient is asymptomatic
 _ Passage of the reported number of ingested packets
 _ The patient has passed at least 2 packet-free stools
 _ Negative plain abdominal radiograph (use contrast-enhanced films if plain abdominal radiograph is equivocal)
 _ Further advice obtained from the regional poisons unit

criteria for all body packers: resolution of symptoms, passage of all ingested packets, at least 2 packet-free stools and a negative plain abdominal radiograph.

Most of our patients (91.8%) were safely managed on surgical wards without the need for higher-level care. The failure rate of conservative management of patients admitted to our unit was 8.2%. This is comparable to that in other large series, confirming the safety of a conservative approach.^{1,8,21,30} In addition, de Prost and colleagues¹² have shown that a good prognosis can be observed with careful monitoring and early detection and treatment of complications.

Our experience suggests that the lack of a clear and reproducible protocol can lead to a variety of approaches being used for individual patients. Traub and colleagues¹¹ recently published an evidence-based treatment algorithm for the management of body packers. Differences in packaging, treatment methods and a lack of randomized controlled trials mean there is still no definitive management strategy advocated for this patient group. We feel a consistent treatment protocol is now required for optimal care, an improved complication rate, a reduction in length of stay in hospital and ease of future audit (Box 1).

The use of our treatment protocol will be audited prospectively over the next 2 years. The effect on specific outcome measures, including complication rate and length of stay, will be assessed to determine its suitability for more widespread implementation.

CONCLUSION

Drug trafficking by body packers is a serious and growing problem. Since the first reports in the 1970s there has been a substantial decrease in morbidity and mortality in these patients. This is most likely due to the change from a primarily surgical to a primarily conservative approach, combined with improvements in the methods of packaging. We found that surgical intervention in these patients is now an extremely infrequent event and confirm the safety of a conservative approach. Despite more than 30 years of experience internationally, to our knowledge there are no prospective randomized controlled studies from which to determine best practice. After reviewing the current literature and our own experience, we propose a treatment protocol that we hope medical practitioners will find useful when managing these patients.

Competing interests: None declared.

Contributors: Drs. Beckley, Ansari and Khwaja acquired and analyzed the data. Drs. Beckley, Ansari and Mohsen wrote the article. All authors designed the study, reviewed the article and approved the final version for publication.

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