Establishment of a definitive protocol for the diagnosis and management of body packers (drug mules)

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ABSTRACT

Background 'Mules' or body packers are people who transport illegal drugs by packet ingestion into the gastrointestinal tract. These people are otherwise healthy and their management should maintain minimal morbidity. In this study, experience with body packers is presented and an algorithm for conservative and surgical management is provided.

Methods The clinical patient database for all body packer admissions at Mary Immaculate Hospital of the Caritas Health Care Inc. from 1993 to 2005 was interrogated. 56 patients (4.5%) required admission out of a total of 1250 subjects confirmed to be body packers and apprehended by United State Customs officials at JFK International Airport, New York. The retrieved patient data were analysed retrospectively.

Results 70% of the body packers were men, with a male to female ratio of 2.8 to 1. The mean age was 33 years and 52% were from Columbia. Heroin was the most common illegally transported substance (73%). 25 patients (45%) required surgical intervention, whereas 31 patients (55%) were successfully managed conservatively. Indications for intervention included: bowel obstruction, packet rupture/toxicity, and delayed progression of packet transit on conservative management. Multiple intraoperative manoeuvres were used to remove the foreign bodies: gastroscopy, enterotomy and colotomy. Wound infection was the most common complication and is associated with distal enterotomy and colotomy.

Conclusions Men were more likely to present as body packers than women. Proximal enterotomies are preferred and multiple enterotomies should be avoided. A confirmatory radiological study is needed to demonstrate complete clearance of packets. A systematic protocol for the management of body packers results in minimal morbidity and no mortality.

There are an estimated 13 million illicit drug users in the USA. Drug trafficking across international borders to the USA from foreign countries remains an active problem. Over 60 million people enter the USA each year via 675 000 aeroplane flights. A common method of illegal drug transport is the concealment of drugs in human orifices; in particular via the gastrointestinal tract by swallowing drug-filled packets (figure 1). Individuals involved with this illegal activity are commonly referred to as 'mules' or 'body packers'.1–3 This method of transport carries significant associated morbidity and mortality caused by bowel obstruction and intoxication following packet rupture.4–7

In New York City there has been an apparent increase in body packer deaths from the early 1990s to the late 1990s, suggesting that this method of transport remains relatively prevalent according to the Chief Medical Examiner.4 Countries receiving these patients are responsible for diagnosing and treating those body packers who develop complications; however, this is made difficult by sporadic case reports that lack established clinical guidelines.8–10 The purpose of the present study is to provide an algorithm for the diagnosis and management of body packers, as well as safe surgical options to reduce morbidity and mortality.

PATIENTS AND METHODS

An institutional board review approval was sought and granted. The institutional patient database (1993–2005) was interrogated for all body packers that required hospitalisation from John F. Kennedy International Airport to Mary Immaculate Hospital of the Caritas Health Care Inc, a major teaching hospital in New York City. The retrieved information included patients’ demographics, methods of diagnosis and indications for conservative or operative management. Various intraoperative manoeuvres to remove packets were analysed and evaluated for complications.

RESULTS

A total of 1250 subjects confirmed to be body packers were apprehended by United States Customs officials at JFK International Airport from 1993 to 2005. The vast majority of patients (95.5%) apprehended by authorities did not require hospitalisation. Fifty-six patients (4.5%) exhibited adverse symptomatology requiring referral for inpatient evaluation and management. Such symptoms included: mental status changes, abdominal pain/vomiting, chest pain, haematochezia and prolonged foreign body retention. Seventy per cent of patients were men, with a male to female ratio of 2.3 to 1. The mean age was 33 years (range 15–74 years) and the countries of origin were Columbia (52%), Nigeria (57%), Dominican Republic (9%) and France (2%). Heroin was the most common illegally transported substance (73%), followed by cocaine (21%).

All admitted patients were subjected to diagnostic modalities that included plain abdominal x-ray films (70%), computed tomography (15%) and others (15%). Plain abdominal x-ray films and computed tomography were confirmed to be body packers that underwent surgical intervention. Indications for surgical intervention included: delayed progression of packet transit on conservative management, bowel obstruction, packet rupture/toxicity, and mental status changes. Indications for intervention included:

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- Multiple intraoperative manoeuvres were used to remove the foreign bodies: gastroscopy, enterotomy and colotomy.
- Wound infection was the most common complication and is associated with distal enterotomy and colotomy.
- Men were more likely to present as body packers than women.
- Proximal enterotomies are preferred and multiple enterotomies should be avoided.
- A confirmatory radiological study is needed to demonstrate complete clearance of packets.

A systematic protocol for the management of body packers results in minimal morbidity and no mortality.
radiographs (figure 2), and CT scans of the abdomen and pelvis (figure 3). Plain abdominal x-ray was diagnostic in 49 patients (88% of all hospitalised patients). However, seven patients (13%) did not exhibit plain x-ray evidence of foreign bodies, requiring non-contrast CT of the abdomen and pelvis to confirm the presence of the packets. Patients with packets found predominantly in the proximal gastrointestinal tract failed conservative management more frequently than those with packets found in the distal gastrointestinal tract. Forty-eight per cent of body packers had positive urine toxicology for illicit substances.

Twenty-five patients (45%) required surgical intervention, whereas 31 patients (55%) were successfully managed conservatively. Thirty-one patients who did not require intervention passed all their packets by day 5. Patients who did not pass the packets by day 5 of observation required laparotomy. Patients underwent laparotomy for three well-defined indications: bowel obstruction in eight (32%), packet rupture/toxicity in nine (36%) and delayed progression of packets in eight (32%).

Multiple intraoperative manoeuvres were used to remove the foreign bodies: gastrostomy, enterotomy, colotomy and bimanual expulsion. In addition, successful intraoperative upper endoscopy was performed on two patients alleviating the need for laparotomy. Proximal gastrointestinal tract enterotomies for packet removal resulted in a lower wound infection rate than distal enterotomies. Complications associated with each operative modality are shown in (table 1). Based on these findings, a protocol for the diagnosis and management of body packers was established (figure 4).

DISCUSSION

Body packers, or drug mules, are individuals who smuggle illegal drugs across international borders using various body cavities such as the gastrointestinal tract or the vagina. Each of these packets contains approximately 5–10 g of illegal substance. Body packers typically swallow between 40 and 150 packets with total cash value ranging from $50,000 to over $1,000,000.11 The packet design has been found to correlate with the country of origin. For example, those from Columbia are usually of very high quality and are constructed with a condom or finger sleeves from latex gloves with cellophane wrap and then dipped in paraffin to resist rupture, whereas body packers from other countries tend to use a variety of packaging, such as untreated condoms and electrical tape, which are poorer in quality and thus more prone to rupture.12

The majority of apprehended individuals were asymptomatic and were able to evacuate all packets during a short period of observation after administration of oral polyethylene glycol solution.13 Only a small proportion required hospitalisation for adverse symptomatology following packet ingestion. Upon arrival, all patients were triaged based on a locally established protocol (figure 4) and managed aggressively.

Plain abdominal x-ray was sensitive in 88% of the drug mule patients, which correlates with published data.14–16 It is considered a study of choice.19 However, occasionally plain abdominal roentgenogram can be non-diagnostic, which warrants CT of the abdomen without oral and intravenous

Figure 1 Sample of paraffin-wrapped latex glove finger packets.

Figure 2 Abdominal x-ray showing foreign bodies throughout the gastrointestinal tract.

Figure 3 CT scan of the abdomen and pelvis of a body packer patient.
contrast to confirm packet retention. Therefore, it is essential that the clinician is aware of the limitations of plain abdominal x-ray with the liberal use of CT in equivocal cases. CT scan was found to be more sensitive and specific. The volume of cases in the present series, although the largest published, did not lend to meaningful statistical data in this regard.

Bogusz et al reported that urine toxicology screen was positive only in 37% of cases of internal concealment. The liberation of cocaine from body packets was demonstrated in vitro and was dependent on wrapping technique and material used. In the present study urine toxicology was positive in 48% of cases. This does not indicate whether packet rupture has occurred, as it has been well described in the literature that drug seepage through the packets may result in a positive drug screen. In addition, 13% of body packers admitted to being active drug users, which has to be taken with a grain of salt. Toxicology screen was positive in 71% of cases with packet rupture. Based on these data, urine toxicology screening may be a useful adjunct in management of body packers. If positive, it informs the clinician of the possible type of drug ingested and aids in pharmacological stabilisation of patients at risk.

Stable patients were candidates for conservative treatment and were admitted to a monitored setting for close observation and haemodynamic monitoring. These patients were given oral polyethylene glycol solution to promote expulsion of the packets. Progression of the drug packets was periodically monitored with the use of serial abdominal x-rays.

Patients who exhibited signs and symptoms of intoxication, obstruction or haemodynamic instability were aggressively resuscitated and prepared for laparotomy. However, the group of patients who failed to pass packets during conservative management were the most difficult to manage and in which to decide when to intervene. In early years surgery was offered to all asymptomatic body packers. It was estimated in a large series

<table>
<thead>
<tr>
<th>Method</th>
<th>Number of patients*</th>
<th>Patients with complications</th>
<th>% Complications</th>
<th>Type of complications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upper endoscopic retrieval</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>No complications</td>
</tr>
<tr>
<td>Laparotomy and manual expulsion via anal canal without enterotomy</td>
<td>13</td>
<td>0</td>
<td>0</td>
<td>No complications</td>
</tr>
<tr>
<td>Gastrotomy</td>
<td>15</td>
<td>1</td>
<td>7</td>
<td>Wound infection and dehiscence</td>
</tr>
<tr>
<td>Small bowel enterotomy</td>
<td>3</td>
<td>1</td>
<td>33</td>
<td>Wound infection</td>
</tr>
<tr>
<td>Colotomy</td>
<td>2</td>
<td>2</td>
<td>100</td>
<td>One with wound infection</td>
</tr>
</tbody>
</table>

*The total is more than 25 as some patients had multiple enterotomies.

**Figure 4** Algorithm for diagnosis and management of body packers.
that the failure rate of conservative management is less than 5%, the rate in the present study is 25/1250 or 2%. In the present study, it was found that patients successfully treated conservatively passed all their packets by day 5. Those who failed to pass packets beyond day 5 ultimately developed complications necessitating laparotomy. Therefore, the authors strongly advocate surgical intervention by the fifth day of observation.

Operative complications are directly related to the operative manoeuvres performed. The greatest morbidity is seen in patients undergoing colostomy, whereas gastrostomy carries a limited morbidity rate of 6.6% in the present study. It should be noted that all complications were related to wound infection and dehiscence. The incidence of wound infection directly correlates with number of enterotomies made and was quoted to be as high as 40% in recent series. Furthermore, there is a direct correlation between complication rate and location of enterotomy, because of higher bacterial concentration of the distal gastrointestinal tract. The authors recommend manual expulsion of distal packets through the anal canal and avoidance of colostomies. Proximal small bowel packets can be expressed retrogradely into the stomach where a gastrostomy can be performed safely for removal, thereby limiting small bowel enterotomies.

Complete clearance of the packets needs to be ensured before discharging the patient. Counting packets based on information obtained from the patient can be unreliable and dangerous as they tend to provide inaccurate information. Thus, a clearance test must be performed before discharging the patient. This test consists of two packet-free bowel movements and a normal plain abdominal x-ray. In patients who were initially found to have a false negative abdominal x-ray, a CT scan of the abdomen and pelvis should be performed for clearance. In conclusion, adopting a systematic protocol for the management of these patients at the authors’ institution has resulted in minimal morbidities and no mortalities. This is the largest published series, but it has its limitations due to the retrospective nature of the study. It is doubtful that a prospective study can ever be done as the patients are engaged in criminal activity and most centres do not see the volume of patients seen in this study.

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