Imaging of Internal Concealment- Experiences at a Single Institution

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Authors: A. Somanathan, K. Wong, P. Child; Sydney/AU
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Aims and objectives

Background

Internal concealment involves ingestion or insertion of packets into a body cavity, generally for the purpose of smuggling drugs across national borders.

Body packers come to the attention of healthcare providers when referred by border patrol and law enforcement officials for suspicion of internal concealment (1).

Radiology has a critical role in the evaluation of internal concealment of drugs or "body packing." Our institution provides imaging for suspected body packers arriving at the busiest airport in Australia. At our institution, the current standard for imaging is a CT Abdomen, with Abdominal Xrays known to have low sensitivity (2, 3)

It is important that radiologists are aware of the current trends as well as potential pitfalls when evaluating imaging of suspected concealment and this project aims bridge this gap in knowledge.

Aim:

To describe and evaluate our experiences with imaging of internal concealment

Objectives:

1. Assess the demographics of individuals positive for concealment

2. Evaluate the patterns of concealment including the number of packets concealed and the location of concealment

3. Evaluate radiological aspects of concealment including the density of concealed packets as well as potential pitfalls when reviewing radiological examinations
Methods and materials

A retrospective review was conducted of suspected body packers referred by the Australian Federal Police to our institution for imaging over a period of 6 years (2010-2015). The RIS & PACS database was searched for imaging studies referred by "Australian Federal Police Outpatients." Only Abdominal Computed Tomography (CT) scans with a request for assessment of concealment was included in the study. The demographic data from the PACS, the CT scan, as well as the report for the examination was reviewed.

Specific data collected included:

i) Age

ii) Sex

iii) Date of initial CT examination

iv) Result of the scan (positive or negative)

v) The approximate number of concealed packets

vi) Location(s) of the concealment

vii) Approximate density of the packets

viii) Complications

ix) Cases of missed concealment by radiologists

xi) Incorrectly performed examinations by radiographers

The density of packets was measured using Hounsfield Units (HU) and was grouped into (<0, 0-50, 51-200, >200) to permit analysis and differentiation between low density and high density concealment.

The location of concealment was classified as involving: rectum, large bowel, small bowel, stomach, vagina, external to the patient (more than one location may be involved).

For this study, Institutional Board review was deemed not necessary as the data was collected retrospectively.
Results

Demographics

Between April 2009 and July May 2015, there were 158 referrals to our institution for imaging of suspected concealment. In all cases, a CT Abdomen was performed.

A total of 38 scans out of 158 scans (23%) were positive for concealment. There were 22 males and 16 females with positive scans. The mean age was 37 years with the range between 21 and 64 years.

Number of Packets

The average number of concealed packets was 50 (range 1-133).

The majority of cases had multiple concealed packets. There were more than 100 packets on 3 scans, 50-99 packets on 11 scans, 6-49 packets on 14 scans and 6 or less packets on 6 scans. On 4 scans, the packets were difficult to count (e.g. not discrete).

Density of Packets

The majority (76%) of concealments had packets of high density (greater than 50HU), with 14 cases have packets of very high density (>200HU). In 5 cases (13%), the concealed packets had a density of less than 0 mimicking gas and faecal material.

In 2 of these cases, the concealment was not detected on the routine soft tissue window and only seen on the lung window.

Location of Concealment

The most common locations for concealment were the rectum (84%), and the colon (76%). In 6 out of the 16 positive female suspects, packets were concealed in the vagina. In 2 cases, there were concealed packets external to the patient. ther intra-abdominal locations for concealment included the stomach (7) and small bowel (6). In 2 cases, there were concealed packets external to the patient

Complications

There were no complications (perforation, small bowel obstruction, collection) identified.
Pitfalls

At our institution, the routine practice for suspected concealment is to perform a non-contrast CT. In one case, oral contrast was given precluding the detection of conceal packets. This suspected was admitted to hospital and observed for 3 clear bowel motions before discharge.

In two cases of concealment, the CT was initially reported as normal by a radiology registrar (Fig 1). In both these cases, the density of the concealed packets was negative, mimicking faeces and bowel gas. The reports were amended within 24 hours by a radiology consultant. It was noted in both cases, that the "lung window" was not used by the radiology registrar and that this made the detection of concealed packets easier (Fig 2). In another positive case, the concealed packets were of low density, again making distinction from faeces difficult (Fig 3). The high density rim and well defined nature of the packets were clues to concealment rather than faeces. The scout should also be routinely reviewed as it may show the well defined nature of the objects more easily (Fig 4).

In 2 cases, there were concealed packets external to the patient
Fig. 1: Selected imaging from abdominal CT in a suspect positive for concealment. The concealed packets in the large bowel were initially missed as the density mimics gas.

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Fig. 2: Lung window from the same scan as Fig 1 at the same level showing the concealed packets more easily.

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Fig. 3: Selected image from different patient showing multiple concealed packets within the sigmoid colon. The high density rim and the rounded nature helped differentiate these packets from faeces.

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Fig. 4: Scout image from the same CT as Figure 3. The well defined nature of the packets can sometimes be seen more easily on the scout image and this should always be reviewed

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Fig. 5: Selected CT from a third suspect. Numerous concealed packets were seen external to the patient within the bra.

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Conclusion

We report our experience with the imaging of suspected body packers at our institution. We found that the most common locations for concealment were the colon and rectum. In females, the vagina was a relatively common location for concealment. The majority of packts were of high density which are easy to identify on the routine non-contrast examination.

Both cases of concealment which were missed by the radiologist on initial evaluation were of negative attenuation, mimicking gas and faecal matter. We recommend all cases of suspected concealment are evaluated with a "lung window" which can help avoid missing these cases.
References

