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CT scan of body packers: Findings and costs

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CT scan of body packers: findings and costs

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Abstract

Objective: To determine the CT features of intra abdominal illicit drug packs used for trafficking ,by using scout CT scan image and describe its cost re-imbursement

Methods: An observational study was conducted from January to December 2005, at the CT scan department, Civil Hospital, Karachi. The study subjects included alleged drug traffickers smuggling by body packing, intercepted at Karachi International Airport and referred for CT scan of abdomen by the Anti Narcotic department. Those with suspected body pack rupture were excluded. Scout CT image of the abdomen was taken. Scans were read on console as well as hard copy for the presence of radio opaque foreign bodies in the gut. The number, size in cm, density in H.U., and the site of foreign body in positive scans were noted. The cost of each scan in terms of technical expenditure and official reimbursement was also determined.

Results: There were 11 alleged traffickers with 9 being males. Positive scans were obtained in 7 of whom 06 were males. All visualized foreign bodies were seen as high density objects (89-340 HU) compared to the surrounding tissues. The size ranged from 1.5-4 cms. All were multiple in number and variable in shape which was oval to elongated in 4 cases. The site was distal ileum in 1, ascending colon in 2 and transverse colon in 4 cases. The technical cost of each procedure was Pak Rs. 300-600 per case for which a reimbursement of Rs. 200-250 was received.

Conclusion: Scout CT scan is good at picking ingested drug packs in the gut lumen. However the test should be conducted in liaison with the reporting radiologist with regard to the possible time of ingestion and rectal passage of foreign bodies. The cost is also under paid at public institutes (JPMA 57:400:2007).

Introduction

Commercial exchange of illegal drugs of abuse, including the equipment and substances involved in producing, manufacturing and using these drugs is known as drug trafficking.[1] Developed efforts of drug control authorities in some countries have diverted trafficking to countries with weaker jurisdiction. This diversion is called the 'balloon effect' and is commonly seen in south and central Asia and Latin America.[1]

A not uncommon method of trafficking is body packing or stuffing whereby traffickers ingest drug filled preparations coated with non digestible water proof material such as latex balloons and aluminum, termed as 'capsules' - a name given by traffickers and interceptors. These are ingested at a time synchronized with the bowel movements so that it passes out via the rectum when the trafficker reaches the destination.

These 'capsules' represent a very unusual form of ingested foreign bodies found in gut lumen since the common foreign objects are coins and meat related objects.[2-4] The intentional swallowing is also described to be limited to adults with psychiatric disorders.[2] Available literature does not describe the imaging features of these 'capsules.

The objective of this study was to determine the CT scan features of the drug packs in gut lumen of alleged body packers using scout CT scans and discuss the cost of CT scan for trafficking cases in terms of cost and its re-imbursement.

Subjects and Methods

This observational study as conducted at the CT scan section, Civil Hospital Karachi (CHK), from January to December 2005. All the alleged body packers intercepted at Karachi International Air port and referred for CT scan to CHK for CT scan were included. Those with presentations suggestive of drug over dosage or acute abdomen due to body pack rupture were excluded.

A frontal view scout CT scan (a digital map of the region to be examined) was conducted without any bowel preparation or oral administration of contrast agent, which is otherwise practiced in all other CT scans of abdomen. The window level varied from +62 to +73 and window width varied from 454-762.Three scout scans were performed for each patient selecting the one with the most optimal contrast for final reporting. The scout scan was considered positive if an intra abdominal foreign body was visible. Its number, size, shape, density and site were noted. Site was determined with reference to the surrounding bowel

gas/mucosal pattern and quadrant wise location in abdomen. Scan was read on console as well as on the hard copy.

The cost of each scan was determined by summing up the cost of CT film, the technical procedure/power utility for image acquisition, processing and printing on an image receptor and the cost of film developing in an auto processor, in Pak rupees.

Results

There were 11 traffickers (9 males and 2 females), including 10 foreign nationals. Positive scans were obtained in 7 (63.63%) of whom only one was a female.

All visualized foreign bodies were seen as higher density objects compared to the surrounding tissues (Figure 1). Their CT density measured in HU (Hounsfield Unit) directly on the console ranged from 89-340 HU. All of these were multiple in numbers, ranging from 08- 43. These foreign bodies were oval to elongate in shape in 04 cases and while variation in shape was noted in the rest. The site was distal ileum, ascending colon, transverse colon and rectum. The size of individual pack ranged from 1.5-4 cms that too was measured directly on the console. Additionally faintly radio-opaque gall bladder calculi were also visible in one case as identified by the shape, location and anatomical relationships (Figure 2). More over the density of the biliary calculi was rather heterogeneous with varying HU values (by +/-28 H.U.) while that of the drug packs was rather uniform varying by only +/- 5 H.U. the size of the individual pack ranged from 1.5- 4 cms, which too was measured directly on the console using electronic calipers.

Figure 1. A scout CT scan showing multiple radio opaque 'capsules' used for body packing.

Figure 2. Another scout film showing simultaneous drug packs as well as the biliary calculi (arrow).

The technical cost of each case (calculated as described earlier in methodology) was Pak Rs. 300-600 and the cost (recovered by the payment on behalf of the referring authority) was only Rs. 200-250 per case. Although all were referred from the Medico legal section of the JPMC, Karachi, none of the referral requisition mentioned identity marks, the time of interception or rectal passage of foreign body. All the cases vehemently denied ingesting any drug pack in any form, even those with positive scans.

Discussion

Ingested foreign bodies are only uncommonly seen in the psychiatrically stable adults.[3-5] Foreign bodies are swallowed either intentionally or accidentally.[2,3] Intentional swallowing is usually seen in those suffering from a psychiatric disorder. The reported series describes an unusual form of intentionally swallowed foreign bodies in the sane adults. The closest foreign bodies mimicking these drug packs descried earlier are pharmacobezoars, which are usually antacids, ulcer healing agents and sodium alginates.[6]

CT scan was done as requested by the referring public office, to obtain a documented proof for prosecution. In order to keep it most cost effective, scout scan was performed. A scout scan is a digital radiograph obtained as the CT table and the gantry move relative to each other. The resultant image is a sharp high contrast radiograph on which

density and size measurements can be easily made. It is variously called the scannogram and localizer and is used to identify the region to be scanned and may give important clues to the over all appearance of the region of interest.[7,8] Although it was negative in 03 cases, it was probably due to late referral where all the ingested drug packs had passed out of the bowels. Alternatively, however, these alleged cases might be true negatives. History as given by the alleged traffickers proved to be completely unreliable as positive cases were seen despite verbal denial.

Majority of the identified packs were moderately to highly dense which was, in all probability, a reflection of the varying nature of the wrapping material which included latex balloons and varying thickness of aluminum and plastic foils. Their shape was completely different from the known and familiar shapes of calculi in the gall bladder[9] and urinary tract[10], and the close anatomical relationship in proximity to the bowel gas/mucosal patterns was diagnostic.

A corresponding or reciprocating series or case report was not available for comparison despite exhaustive literature search. Valente et al[11] have described imaging of aluminum foreign bodies placed in the upper esophagus of ten randomly selected cadavers using antero-posterior and lateral x-rays of the region. It was found that aluminum foreign bodies could be often but not always visualized on radiographs. It was concluded that the sensitivity of this method was not adequate to completely rule out aluminum foreign bodies.[11] Aluminum is also considered more hygroscopic than plastic fiber.[12] It was the probable reason for its use as the wrapper for drug packs since it can resist the digestive as well as the moistening action of the GIT secretions. The limited capability of the radiograph alone suggests that additional tests should be carried out when potentially radiolucent foreign bodies are suspected in gastro-intestinal tract.[9] CT scan is an ideal investigation for this purpose. It can detect minimal differences in shades of gray. In conventional radiography, the different shades of gray seen on a film represent the differences in the transmission of an x- ray beam as it passes through the body. CT, on the other hand, approaches the ideal by presenting the average attenuation of each small volume element of the sliced portion of body presenting it quantitatively with accuracy far greater than can be accomplished by conventional techniques.[13] It is always preferred when a general survey of the whole abdomen is needed.[14] It can also localize whether a foreign body is in gut lumen or not.[15]

Contrast imaging with per-oral barium administration shows presence of foreign bodies as hold up of barium, deviation or fork in barium.[16] Barium residue on foreign body may also outline it or it may show as a filling defect.[16]

Documentation of these features, for foreign bodies taken with an illicit intention, forms an important part of the legal evidence for prosecution. The main aim of the referring source was to use CT as a screening test for proving the case.

The location of a foreign body in the GIT lumen is dependent upon the duration since its ingestion. However the referral letter lacked any information regarding the time of interception or the intended destination to make any working estimate of the possible time of ingestion and there fore its possible site in GIT. The alleged trafficker just walked in official custody and had to be scanned then and there. Bowel preparation was of course contra indicated as it would have expelled all the normal and abnormal contents of the gut. Per oral contrast was also not given so that subtly dense foreign bodies may not get hidden. As per referral letter terms, only scout CT scans were performed and barium studies were not resorted to.

Despite visualizing the drug packs, there were certain lacunae in the whole procedure. Apart from non availability of the history, liaison with the reporting Radiologist was never sought.

The cost of the procedure and its re-imbursement remained an important consideration. These scans were conducted in a public sector hospital with nominal charges. The official escort paid Pak Rs. 200-250 as they were instructed not to pay more and being public office referral with medico legal implication, the procedure could not be refused. This is a thought provoking situation since it did not even cover the expenses which were incurred on conducting these scans. The estimate, excluding the technologist and radiologist's time for conducting and reporting these CT scans- was between Rs. 300-600 per case.

It is a known trend to under reimburse professional costs for CT scan and over reimburse the technical cost.[17] This conclusion was drawn by determining the costs of procedures in a large academic radiology department by analyzing actual resource consumption using an activity based costing and comparing them with Medicare payments.[17] However, in the reported series even the technical cost was under re imbursed.

Another point of concern was the high radiation dose delivered to the patients during routine computed tomography examinations which is a known fact.[18] As yet there is not enough evidence to recommend that large scale use of CT screening of ostensibly healthy adults has health hazards or benefits.[19]

Another fallacy lies in differentiation from geophagia and iodinated medicines. False positive outcome is quite likely in these cases although history and the

circumstantial setting may be decisive

The indiscriminate use of CT scan is also being noticed in the West and medical educators are questioning the necessity of CT screening in view of its expense, radiation delivered, the laziness it promotes, and the consequences when it is misinterpreted.[20] The consideration is particularly valid when there is medico-legal implication such as in the stake holders of the present series.

The main strengths of this study are presenting a completely novel data about a relatively unrecognized medico-legal situation and the potential improvements that might make the radiological investigations more useful for the State.

The main limitations are the same as those of all observational studies that is the inability to confirm or refute a hypothesis. Another limitation is the bias induced by the inability to extract a correct history due to medico-legal context.

Density measurement was a main objective method of identifying the drug packs. It has previously been proved to be reliable in identification of urinary calculi in terms of constituents -whether oxalates, urates, struvites or mixed.[21] to the extent of influencing management.[22] Another limitation is using non-helical CT due to availability limitation. Helical CT has proven efficacy in diagnosing radio-dense objects without need of routine preparation. Although the clinical situation which has received the most benefit from this application is urolithiasis[23-25], illicit drug pack screening presents a grossly similar situation where a minimally to grossly dense foreign object has to be found in abdomen with respect to location, without resorting to bowel purgation. Helical CT may prove highly efficacious in this scenario but at considerably higher cost which is an issue in medico-legal practices in state-referred cases.

Conclusion

Scout CT scan is good at picking ingested drug packs in the gut lumen. However the test should be conducted in liaison with the reporting radiologist with regard to the possible time of ingestion and rectal passage of foreign bodies. The test is also under re-imbursed at public institutes.

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