

CASE REPORT

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A Fatal Case of Cocaine Poisoning in a Body Packer

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ABSTRACT: A 27-year-old man was carrying in his digestive tract 99 packages each containing about 10 g of a 86% cocaine powder. The courier died by acute cocaine intoxication due to inflation and rupture of four packages during a flight from Bogotá to Rome. At the autopsy, the external examination was unremarkable. The internal examination showed edema and generalized congestion of the organs.

Toxicological analyses were performed by gas chromatography-mass spectrometry after solid phase extraction using Bond Elut Certify columns and derivatization with BSTFA/TMCS. High levels of cocaine and benzoylecgonine were found in blood (4.0 $\mu\text{g/mL}$ and 17.0 $\mu\text{g/mL}$), urine (152.0 $\mu\text{g/mL}$ and 512.0 $\mu\text{g/mL}$), bile (99.8 $\mu\text{g/mL}$ and 54.0 $\mu\text{g/mL}$), vitreous humor (7.1 $\mu\text{g/mL}$ and 5.8 $\mu\text{g/mL}$), brain (7.5 $\mu\text{g/mL}$ and 3.5 $\mu\text{g/mL}$), and hair (55.5 ng/mg and 27.7 ng/mg). The presence of the cocaine and its metabolite in the hair suggested that the man was a cocaine user.

KEYWORDS: forensic science, cocaine, body packers, fatality, smuggling

Cocaine comes into Europe mainly from South America through sea and air routes. In Italy the air route is the most frequently used for direct trafficking of cocaine from South America (Venezuela, Colombia, Ecuador), mostly by internal bodily concealment.

The smuggling of illicit drugs, either swallowed or inserted into the rectum or vagina, occurs frequently due to detection difficulty and to potentially high financial gains. This practice is not without risks; drug intoxication, which may be fatal, intestinal obstruction, and peritonitis by foreign bodies has been reported (1–6).

Physical and behavioral signs such as pallor, sweating, and nervousness may induce custom controllers to take the body packers to the nearest medical center where they are examined by X-ray and helped to expel the packages either by medical or, in rare cases, surgical intervention (7,8).

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Although the drug traffickers have become more sophisticated in their packaging in order to assure the complete recovery of the swallowed drug at the travel destination, the rupture of drug packages is always possible.

Furthermore, the gastric and duodenal juices may seep into the packets and dissolve their content, allowing the absorption of the drug.

This may originate a rapid, acute, and often fatal intoxication.

Case History

A 27-year-old Colombian man was flying from Bogotá to Rome Fiumicino Airport. During the flight he became suddenly ill and within a few minutes he died, despite the efforts of a medical doctor who was flying in that aircraft.

Autopsy revealed that the man was carrying 99 packages in his gastrointestinal tract, each containing about 10 g of white powder.

Autopsy Findings

Autopsy was performed in Rome three days after death. In the meantime the body was kept at +4°C. The body was well preserved and measured 180 cm in length and weighed 78 kg. The external examination was unremarkable and there were no signs of chronic drug abuse.

The internal examination showed pulmonary edema and generalized congestion of the organs.

The stomach contained about 50 mL of a brownish fluid with yellowish granules and 12 cylindrical intact packages wrapped in soft plastic material (later identified as latex of surgical gloves). Each packet measured 4 cm in length and about 1.5 cm in diameter. One burst packet was found in the stomach and only a few milligrams of the original material remained in the packet. Another burst packet was found in the ascending colon.

The exploration of the intestinal loops revealed the presence of 85 packets of the same type piled from the small intestine to the descending colon. The mucous of the first segment of the small intestine showed coarse yellowish granules similar to those in the stomach.

All 99 packets and samples of blood from the heart, urine, bile, vitreous humor, brain, and hair were taken for toxicological analysis. The specimens were stored at –20°C without any preservative addition.

Histological Findings

The examination of the specimens after standard hematoxylineosine staining showed:

- *Heart*: severe congestion with fragmentation of numerous myocardiocytes and thickening of the walls of the main branches of the coronary arteries.
- *Lung*: emphysema with septum breakage; severe congestion of the capillaries of the septa; alveolar cavities filled with amorphous acidophilous material due to edema.
- *Liver*: vacuolar degeneration of many hepatocytes. Congestion of peri-lobular and central-lobular sinusoids. Many lymphocytes in portal spaces.
- *Kidneys*: renal glomeruli morphologically and numerically well represented. Postmortem degeneration of tubular epithelium. Tubules morphologically normal. Congestion of the medulla.
- *Brain*: postmortem autolysis; evidences of edema and congestion.
- *Gastric mucous membrane*: thickening of some areas of the epithelium and presence of many extravascular erythrocytes.

Toxicological Findings

Qualitative and quantitative analyses were performed on the 99 packages recovered during the autopsy. Ninety-five of them were still intact; two packages were burst open and contained only residual traces of powdered material.

Two packages looked inflated and appeared to be filled with different amounts of a dense liquid substance.

The 95 packages were wrapped with three layers of latex, each secured with thin thread, one layer of plastic foil, and another latex layer that contained about 10 g of cocaine hydrochloride, for a total of 950 g of powder.

Quantitative analysis using a model 3300 gas chromatograph (Varian) equipped with an Flame Ionisation Detector (FID) detector revealed a cocaine purity of 86%.

The residual traces of the two open packages as well as the liquid in the two inflated packages were found to contain cocaine hydrochloride.

An interesting finding about the two inflated packages was that the larger one contained a liquid with a pH value of about 1; the smaller package contained a liquid with a pH value of about 7.5. This suggested that the seeping happened in different parts of the digestive tract: the former was inflated by gastric juice (acid) and the latter by duodenal fluid.

Toxicological analysis on biological material was performed in order to assess the distribution and the amount of the drug and its metabolites in blood, urine, bile, vitreous humor, brain, and hair. The analysis started about one week after the autopsy; in the meantime all the specimens were kept frozen at -20°C .

The analysis was performed by gas chromatography-mass spectrometry (GC/MS) using Hewlett Packard instrument model 5890/5971A. The purification of biological samples and the extraction of the drug were achieved by solid phase extraction (SPE) using Bond Elut Certify I columns (Varian) according to the procedures suggested by the manufacturer. The detailed toxicological results are shown in Table 1.

Norcocaine and methylecgonine were identified in brain, blood, urine, vitreous, and hair; in this latter matrix, nicotine and dihydrocodeine were also found.

TABLE 1—Distribution of cocaine and its metabolite benzoylecgonine. Toxicological results are expressed in $\mu\text{g}/\text{mL}$ or $\mu\text{g}/\text{g}$.

	Cocaine	Benzoylecgonine
Blood	4.0	17.0
Urine	152.0	512.0
Bile	99.8	54.0
Vitreous Humor	7.1	5.8
Brain	7.5	3.5
Hair	55.5*	27.7*

* Results are expressed in ng/mg.

Discussion

Smuggling illicit drugs by the use of body packing occurs frequently, although the risk of leakage or package bursting is known.

The above case reports of both events (i.e., the bursting and leakage) occurred in four out of the 99 packages smuggled internally by the courier. Two packages burst open with only residual traces of the cocaine powder and digestive juices inflated two others. It is noteworthy that the larger envelope contained acid juice (it was probably inflated by gastric liquid) and the smaller, found in the jejunum, was filled with alkaline liquid as if its contents had already been absorbed by the small intestine.

It is thus possible to presume that the man was intoxicated by the absorption of an amount of pure cocaine exceeding 20 g.

This could justify the high cocaine and benzoylecgonine levels revealed at the toxicological analysis.

Other authors describing massive intoxication cases also reported high cocaine concentrations. Patel described an extremely high level of cocaine ($104 \mu\text{g}/\text{mL}$) found in the blood of a drug courier dead after packages burst (9).

In a recent study, Karch et al. found a mean blood concentration of 1.12 ± 2.71 for cocaine and 1.54 ± 1.68 for benzoylecgonine in 46 cases of death related to cocaine intoxication (10).

Jenkins et al., examining 100 consecutive deaths, found mean cocaine and benzoylecgonine blood concentration of $908 \mu\text{g}/\text{mL}$ and $3960 \text{ ng}/\text{mL}$ respectively (11).

In our case, the high amount of benzoylecgonine found in almost all the samples may be justified or by the "in vivo" metabolism of the cocaine or by postmortem enzymatic hydrolysis due to the fact that the autopsy was authorized three days after the death (11,12).

In the first hypothesis it could be assumed that the rupture of the two packages and the inflation of the other two happened at different times after the ingestion.

The presence of the cocaine and its metabolite in the hair shafts, about 4 cm long, indicates, according to the present knowledge on drug metabolism, that the man was a cocaine user. It is in fact very unlikely that the cocaine from the swallowed packets could have reached the hair shafts in such a short time.

We couldn't find in the literature cocaine levels measured in body packer's hair, but the concentrations reported in the present paper are in agreement with those reported for daily users (i.e., coca chewers: 1.4 to $50.6 \text{ ng}/\text{mL}$ and 0.4 to 17.6 for cocaine and benzoylecgonine respectively) (13).

Although a tolerance to the drug can be induced by long-term consumption, it may not prevent the risk of poisoning when such a high amount of the drug enters the bodily fluids.

According to other authors, the risk of fatal outcome by acute intoxication is more likely to happen when the poisoning occurs in

situations where it is not possible to receive rapid and intensive medical care (14).

The medical doctor who happened to be on the aircraft was alerted only when it was probably too late. Adequate medical equipment was not available as well.

The "body packers" or "mules" or "stuffers" or "swallowers" are often employed because of the difficulty of their detection at custom controls. In over a decade of laboratory experience, it was found that they carry an average of one kilo of drug (less in the case of heroin) in packages ranging from 8 to 10 g each.

They are recruited among the lower layers of the population of emerging countries and are mainly young males who run a high risk for a relatively low compensation (about \$1000 according to police information). This affords higher profits to the criminal organizations.

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