CASE REPORT

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Sudden Death Associated with Contrast Medium, Sinografin®

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ABSTRACT: A case of sudden death following the injection into the uterine cavity of a contrast medium, Sinografin®, is reported.

KEYWORDS: pathology and biology, death, radiopaque agents, Sinografin®

The object of this report is to document a sudden death associated with the injection into the uterus of Sinografin®, a contrast medium.

Case Report

A 35-year-old black woman was admitted to the Booth Memorial Hospital, Cleveland, OH, with diagnosis of dysfunctional uterine bleeding and hypertension. The patient was taken to the operating room on 6 May, 1985 for the performance of a Pap smear, a dilatation and curettage of the uterine cavity, and a hysterosalpingogram. Ten cubic centimetres of Sinografin, a contrast medium, were injected into the cervical canal, after which she developed bradycardia and cardiac arrest. Cardiopulmonary resuscitation was undertaken immediately. Oxygen was administered along with the intravenous administration of sodium bicarbonate, epinephrine, atropine, and calcium chloride. Cardiac defibrillation was undertaken. All efforts failed and she was pronounced dead shortly thereafter.

Laboratory tests performed when the patient was admitted included: sodium 151 meq/L, potassium 4.5 meq/L, chloride 106 meq/L, glucose 470 mg/dL, blood urea nitrogen (BUN) 11 mg/dl, and CO_2 22 meq/L.

Autopsy was performed at the Coroner's Office, Case 192692. The decedent was a 35-year-old black female, 68 in. (173 cm) in height and weighing 262 lbs (119 kg). The major findings included pulmonary edema, moderately severe intimal sclerosis of the anterior descending branch of the left coronary artery, atheromata of the aorta, and a slightly enlarged right ovary with subcapsular cysts. The uterus was normal in size and shape and revealed a dark-red hemorrhagic endometrium. The heart weighed 375 g. The remainder of the autopsy showed no significant gross or microscopic abnormalities. Toxicology screen was negative

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for blood alcohol, acetone, methyl alcohol, benzodiazepenes, barbituates, phenobarbital, Doriden®, meprobamate, methaqualone, Placidyl®, Tylenol®, salicylate, amphetamines, and bases.

The anatomic diagnoses were:

1. Cardiopulmonary arrest following intrauterine injection of Sinografin for dysfunctional uterine bleeding.
   (a) Pulmonary edema.
2. Coronary hypertensive sclerotic heart disease.
   (a) Cardiomegaly (375 g).
3. Atheromata of the aorta.

Discussion

The contrast medium injected into the decedent's uterus, Sinografin, contains diatrizoate meglumine ($C_{11}H_{13}N_2O_4 \cdot C_7H_{17}NO_5$) and iodipamide meglumine ($C_{20}H_{14}I_6N_2O_6 \cdot 2C_7H_{17}NO_5$). Most adverse reactions to radiographic contrast media (RCM) are immediate in onset [*1*] and include a wide variety of clinical responses such as:

(1) cardiovascular (arrhythmia and hypotension),
(2) respiratory (laryngospasm and wheezing),
(3) dermatologic (urticaria, angioedema),
(4) neurologic, and
(5) gastrointestinal (nausea, vomiting).

Several authors [*2,3*] have studied deaths following the administering of contrast media. Hartman et al. [*2*] collected 300 000 consecutive patients who had excretory urography and four deaths were recorded. One patient had bronchospasm and cardiac arrest; a second had laryngospasm and cardiac arrest; a third had cardiac arrest immediately following the injection of Renovist® II; a fourth developed pulmonary edema after infusion of Reno-M-DIP®. Lalli [*3*] studied 228 deaths associated with contrast media, including 15 following or incident to IV cholangiography, 69 following angiography, 140 following urography, and 4 other deaths. According to Lalli [*3*], ventricular fibrillation appeared to be the most common terminating event in these sudden deaths, and the same author stated that a significant number of deaths were a result of pulmonary edema. Lalli believes that the most important factors in the production of adverse contrast media reactions are the patient's fear and apprehension.

Brasch [*4*] states that there is now a body of substantial evidence indicating that severe contrast media reactions in certain individuals are mediated by a contrast medium antibody interaction. The same author believes that allergic patients have a definitely greater risk, from two to five times that of nonallergic individuals, of experiencing a contrast media reaction.

Electrocardiographic monitoring of 406 patients undergoing IV urography was performed before, during, and after the examination [*5*]. Major cardiac arrhythmias and ischemia were encountered frequently in those with cardiac disease but occurred also in healthy individuals (5%). Ectopic ventricular beats, the most common abnormality, are usually transient but remain the most potently lethal of the effects of IV contrast media on the heart. Current investigation indicates that most cardiac alterations occurring during IV contrast media administration can be ascribed to the hyperosomality and direct chemotoxicity of the contrast media.

Fischer and Thomson [*6*] state that of prime importance is the amount of sodium in the contrast medium.

The precise mechanism leading to death in the patient described in this report is not clear. However, the sudden onset and rapid death suggest a lethal effect on the heart by the contrast medium.

References

[1] Simon, R. A., Schatz, M., et al., "Radiographic Contrast Media Infusions," *Journal of Allergy and Clinical Immunology*, Vol. 63, 1979, pp. 281-288.
[2] Hartman, G. W., Hattery, R. R., Witten, D. M., and Williamson, B., Jr., "Mortality During Excretory Urography: Mayo Clinic Experience," *American Journal of Roentgenology*, Vol. 139, Nov. 1982, pp. 919-922.
[3] Lalli, A. F., "Contrast Media Reactions: Data Analysis & Hypothesis," *Radiology*, Vol. 134, 1980, pp. 1-12.
[4] Brasch, R., "Evidence Supporting an Antibody Mediation of Contrast Media Reactions," *Investigative Radiology*, Vol. 15, 1980, pp. S29-S31.
[5] Pfister, R. and Hutton, A. Jr., "Cardiac Alterations during IV Urography," *Investigative Radiology*, Vol. 15, 1980, pp. S239-S242.
[6] Fischer, H. W. and Thomson, K. R., "Contrast Media in Coronary Arteriography, A Review," *Investigative Radiology*, Vol. 13, No. 5, 1978, pp. 450-459.

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