CASE REPORT

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Illicit and Licit Drugs Causing Perforation of the Nasal Septum

REFERENCE: Vilensky, W., **"Illicit and Licit Drugs Causing Perforation of the Nasal Septum,"** *Journal of Forensic Sciences,* JFSCA, Vol. 27, No. 4, Oct. 1982, pp. 958-962.

ABSTRACT: Examination of three patients who were presented for routine physical examinations revealed significant perforations of the anterior nasal septum. A 26-year-old male and 28-year-old female with this defect have been chronic abusers of cocaine by nasal inhalation. A 69-year-old female showed a similar defect by overuse of a common over-the-counter nasal spray containing the decongestant phenylephrine. Both drugs are powerful vasoconstrictors that reduce blood flow to the local area. With prolonged use there is persistent deprivation to the tissue of oxygen necessary for cell viability, with resultant necrosis. Additionally, the physical irritation from the impingement by these drugs on the nasal membranes further hastens the destructive process. Finally, the tissue breakdown is complete with perforations of various sizes.

KEYWORDS: toxicology, pathology and biology, nasal septum, perforation, cocaine, phenylephrine, vascoconstrictor, otorhinolaryngologist, leukoplakia, rebound congestion

The increasing use of illicit "recreational" drugs of abuse and the use, misuse, or overuse of licit drugs by the nasal route of administration may soon become the leading causative agent of nasal septal perforation. Several causes lead to this defect in the midline nasal wall. Systemic diseases used to be a common cause, but with the advent of antibiotics and other chemotherapeutic agents, septal perforations have all but disappeared with tertiary lues [*1*], tuberculosis, and leprosy. Now, the most common causes are complications of nasal surgery, septal injuries, repeated trauma, nose-picking, and chronic infections. Most perforations occur in the cartilaginous septum (anteriorly) but may also be seen in the bony septum [*2*]. Septal abscesses will cause the septum to balloon out on each side, depriving the tissue of blood supply, and eventually a necrosis of the cartilage. Infections drain through the angular vein to the inferior ophthalmic vein and then to the cavernous sinus with the threat of thrombosis. Cancer is rarely a cause.

The common drugs illicitly used are amphetamine, methamphetamine, and cocaine. The licit drugs are those drugs prescribed by licensed physicians or dentists for legitimate medical treatment and those drugs that can be purchased by the user without a prescription, such as over-the-counter (OTC) nasal inhalers, sprays, and drops for nasal congestion secon-

Received for publication 11 March 1982; revised manuscript received 14 April 1982; accepted for publication 19 April 1982.

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dary to infections, allergies, foreign bodies, and humidity, temperature, and barometric changes. In many cases of upper airway infections, the blood vessels in that localized area will dilate to supply more blood to the areas of insult. The purpose and action of decongestant drugs is to cause vasoconstriction of these vessels, thereby effecting a more patent airway with subsequent ease in nasal breathing.

In large or frequent doses of overused prescription or OTC drugs, or high concentrations [*3*] of drugs used for nonmedical purposes, the initial vascular response is one of severe vasodilation and engorgement, causing an airway obstruction. This paradoxical reaction—dilation from a drug that normally causes constriction—is also seen in other areas of the body lined with mucous membrane and is sometimes more severe than the original inflammatory response [*4*]. When this phenomenon is frequently repeated, the nasal membranes become hypertrophied and sometimes hemorrhagic, thus causing further obstruction. As the vessels start their return to normal size, an opposite or compensatory mechanism occurs to constrict the vessels, which then later dilate to the normal physiologic state. Repeated administration of drugs will eventually cause a loss of the normal vascular and glandular structure and function and the membranous lining of the nasal cavity becomes hypotrophic or atrophic.

There are purely mechanical factors involved also. The forceful inhalation or spraying of these drugs impinge on the smooth linings. Powdered and crystalline forms of cocaine, amphetamine, and methamphetamine show sharp and barbed edges microscopically, and these inhaled particles disrupt the continuity of the intact membrane.

Eventually, with the combination of mechanically produced nicks in the membrane, the deteriorated atrophic membrane, and the recurrent irritation of nasally applied chemicals, a small defect or hole occurs. The first symptoms of this small perforation are the patient's awareness of a whistling in the nasal cavity during inhalation, crusting [*3*] around the defect, and some slight bleeding [*1*]. This is followed by obstruction, and frequently the patient will increase his/her use of the decongestant. Many cocaine abusers complain of nasal stuffiness and frequently use phenylephrine or oxymetazoline nasal sprays, which further hasten the pathologic changes. As the ischemic process continues to hinder healing, the area becomes necrotic and the hole enlarges. As the perforation gets larger, many, if not all, of the symptoms disappear and the prognosis does not seem to be unfavorable.

Presentation

Three cases from a file of drug abuse patients were selected because of the discovery of nasal septal perforations resulting from the inhalation of chemicals that cause severe vasoconstriction.

Case 1

A 26-year-old white male of U.S. citizenship was examined at a Family Practice Center in Camden, NJ. A routine history and physical examination were performed. The history revealed no complaints of recent or past chronic illnesses. The physical examination noted a slightly asthenic body that was generally unkempt and a shirt on which was imprinted a picture of the *Cannabis sativa* plant (marijuana). His pupils were slightly dilated and reactive to light stimulus. There were signs of old puncture sites in the antecubital fossae. All vital signs were normal and all palpable organs were within normal range. However, on examination of the head and neck, an elliptical perforation measuring 6.7 mm was discovered in the anterior nasal septum. The patient was asymptomatic and unaware of the presence of the defect, and he denied the use or abuse of licit or illicit substances. Upon more vigorous questioning and explanation of the newly discovered lesion, the patient did admit to the smoking of marijuana and frequent inhalation of cocaine for several years. The patient refused a

scraping of the involved area for a cytologic study, and a consultation was arranged with an otorhinolaryngologist; the appointment was never kept.

Case 2

A 28-year-old black female of U.S. citzenship was seen at a Central Intake Unit in Camden, NJ, for the New Jersey Department of Health, Division of Narcotic and Drug Abuse Control. The purposes of the routine examination were evaluation and an appropriate treatment referral for her substance abuse. Her history revealed the abuse of cocaine by nasal inhalation; the physical examination was essentially unremarkable except for the discovery of an elliptical septal perforation in the cartilaginous (anterior) area 8.0 mm in length. Careful scrutiny with an illuminating lamp showed that the border of this lesion had a pearlescent sheen. The rest of the nasal vestibule was hyperemic and boggy. A scraping of the border was obtained with a Pap smear wooden blade and sent to the laboratory for a cytologic study. The results showed a leukoplakia, a precursor stage to malignant change.

Case 3

A 69-year-old white female was seen at the East Camden Family Practice Center of the University of Medicine and Dentistry of New Jersey/New Jersey School of Osteopathic Medicine in Camden, NJ. She complained of fullness in her throat and copious postnasal discharge. In her history she related an episode of pulmonary tuberculosis; she had been hospitalized for that condition for two years. There was no apparent active tuberculosis in any other area of the body. During her stay at the sanatorium she experienced nasal congestion and was introduced by her roommate to a common OTC nasal spray containing phenylephrine, which she used to obtain vasoconstriction and relief of her problem. The use of this medication, a sympathomimetic amine, causes an initial vasoconstriction; but, like all medications in this category [5], it has the disadvantage that use may be followed by a rebound congestion. This after-congestion can be the same, or worse, than the original congestion and prolonged use often results in chronic rhinitis.

The patient continued to use the spray to relieve this rebound phenomenon and the entire process became repetitive to the point where she was using the spray about twelve times a day instead of the recommended does of four times a day. This habit continued for at least 2½ years and extended beyond her discharge from the sanatorium.

Physical examination showed an asthenic 32.6-kg (72-lb) female who was quite anxious and tense. She feared she had tuberculosis of the larynx. Her vital signs were normal as were auscultation and percussion of the thorax and pharyngeal and laryngeal examination. On examination of her nose, a large elliptical anterior septal perforation measuring 10 mm in length was glaringly obvious. Chest X-rays, nose and throat cultures, and a subsequent evaluation by an otorhinolaryngologist evinced no abnormalities. The patient knew that she had this perforation, which appeared after her discharge from the sanatorium, but never claimed any symptoms or discomfort.

Summary

Three case studies reveal nasal septal perforations after prolonged use of illicit and licit drugs that also cause severe vasoconstriction. In Cases 1 and 2, septal perforations were associated with the illicit use of cocaine administered by nasal inhalation. In Case 3, a large perforation was associated with the overuse of a nasal decongestant, phenylephrine, which was sprayed into the nasal cavity. Phenylephrine is an ingredient in many OTC nasal sprays and can be bought by anyone without medical guidance and used in excess. That statement does not imply that those products should be prescription-only drugs.

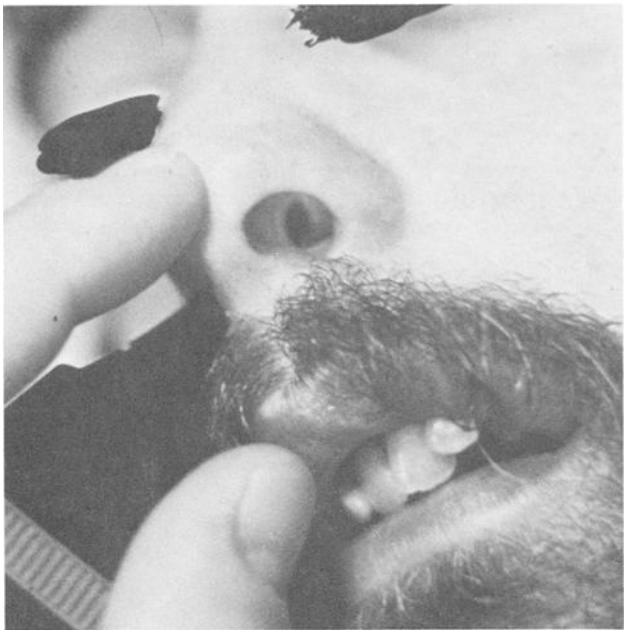

FIG. 1—*Case 1.*

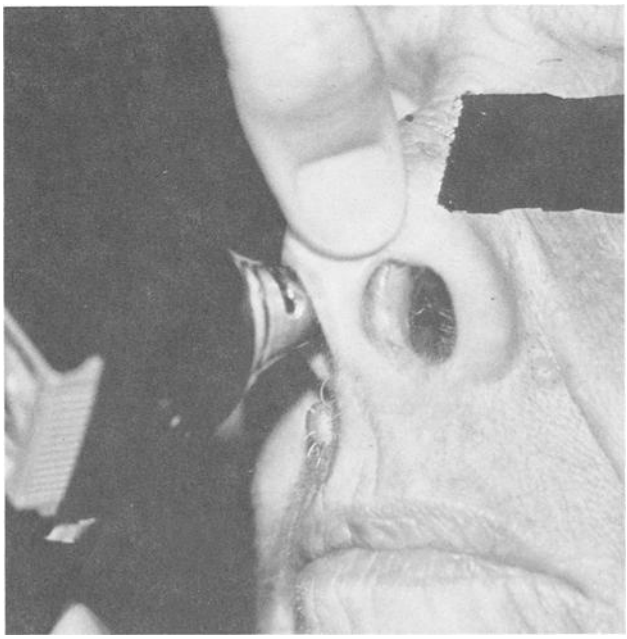

FIG. 2—*Case 3.*

All of the perforations were elliptical. Slides of Cases 1 and 3 are included in this report as Figs. 1 and 2, respectively. In Case 2, a cytologic study revealed a leukoplakia, warning of the potential of neoplastic changes.

With marked increase in the use of cocaine as a "recreational" drug, there is reason to suspect that the incidence of nasal septal perforations will increase while the incidence of these lesions from systemic diseases and septal infections will decrease. Dentists and primary care physicians should be alerted to look for such perforations and entertain the suspicion of drug use or abuse as a possible causative agent when detecting a nasal septal perforation.

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