

RHINOLOGY

Psychological aspects and treatment of patients with nasal septal perforation due to cocaine inhalation

Aspetti psicologici e trattamento dei pazienti affetti da perforazione del setto nasale da abuso di cocaina

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SUMMARY

Use of cocaine, by inhalation, is currently increasing in Western Countries and its use is superseding heroin in the rising generation. Young people of the third millennium use narcotics to avoid the negative conditions of daily life and to escape on "unreal" trips, as happened in the '60s and '70s for the heroin-addicted. Today, on the contrary, people addicted to cocaine want to be more competitive and "winners" and believe that cocaine can help them to reach this goal. A series of 104 patients (75 male, 29 female), aged between 16 and 54 yrs, all habitual inhaling cocaine users (≥ 10 times per month) have been observed for 2 years. Among them, 11 (10.5%) had nasal septal perforation, which is frequently related to cocaine use. Of these 11 patients, 8 (72.7%) had nasal septal perforation of the quadrangular cartilage, while in the other 3 (27.3%) the perforation involved also the bony tract (vomere-perpendicular ethmoidal lamina). Psychological analysis of these 104 patients is reported: 62 patients (59.6%) answered that they inhaled cocaine to improve endurance and to feel stronger and less tired; 34 patients (32.7%) in order to enjoy themselves more during parties and to communicate more effectively with other people; 5 patients (4.8%) to gain confidence and to overcome their shyness, 2 patients (1.9%) to improve their sexual performance and 1 patient (1%) to drink more alcoholic drinks for a longer time without feeling sleepy. All the patients underwent psychotherapeutic treatment, but the lack of compliance and constantly missing the scheduled follow-up visits resulted in complete therapy being performed in only 16 patients (15.3%). All the patients with nasal septal perforation underwent rhino-endoscopy, at T0, with 0°, 45° endoscopes, computed tomography scan of nose and paranasal sinuses and biopsy. At the time of the observational period, none of the 11 patients who presented nasal septal perforation agreed to stop cocaine abuse; therefore, a temporary solution has been offered to all the patients (accepted by 3 of them), i.e., the positioning of a silicone button to close the perforation and, thus, improve the air flow in the nose and reduce progression of local necrosis. Together with the button, the positioning is described, under local anaesthesia, of two layers per septal side of hyaluronic acid, at different levels of esterification, kept in site by the button as a "sandwich" in order to obtain better re-growth of the mucosa and fewer scabs and bleeding.

KEY WORDS: Nose • Nasal septal perforation • Cocaine • Adverse effects • Psychological therapy • Surgical therapy

RIASSUNTO

L'uso della cocaina è oggi in crescente aumento ed il suo utilizzo sta soppiantando l'assunzione di eroina nelle nuove generazioni. I giovani del terzo millennio si servono delle sostanze stupefacenti per sfuggire alla realtà quotidiana, per rifugiarsi in viaggi "irreali" come avveniva negli anni '60 e '70 per coloro che utilizzavano l'eroina, ma al contrario di allora il fine oggi prefisso è di essere più competitivi e "vincenti", e ritengono che la cocaina possa "aiutarli" a questo scopo. Per un periodo di 2 anni sono stati osservati 104 pazienti di età compresa tra 16 e 54 anni, 75 maschi e 29 femmine, tutti consumatori abituali di cocaina (almeno 10 volte/mese). Tra di essi 11 (10,5%) presentavano perforazione del setto nasale che come è noto rappresenta un frequente esito dell'uso della cocaina. In 8 pazienti (72,7%) la perforazione del setto interessava solo la cartilagine quadrangolare del setto mentre nei restanti 3 casi (27,3%) era anche coinvolto il tratto osseo del setto (vomere-lamina perpendicolare etmoidale). È stato effettuato uno studio psicologico sui pazienti circa le motivazioni che li inducevano all'utilizzo di cocaina; il 59,6% (62 pazienti) ha risposto che assumeva la sostanza per vincere la fatica e sentirsi più energico e meno stanco, il 32,7% (34 pazienti) per meglio partecipare alle feste e comunicare più efficacemente con gli altri, il 4,8% (5 pazienti) per aver più fiducia in sé stessi e vincere la timidezza, l'1,9% (2 pazienti) per migliorare le performance sessuali ed infine l'1% (1 paziente) per poter bere alcolici più a lungo e senza accusare sonnolenza. Tutti i pazienti sono stati sottoposti a trattamento psicoterapeutico, anche se la compliance e la costanza nel seguire le sedute programmate ha consentito di portare completamente a termine il percorso di terapia solo nel 15,3% dei casi (16 pazienti). I pazienti con perforazione settale sono stati sottoposti ad esame rinoendoscopico a fibre ottiche, TC del massiccio facciale, biopsia con esame istologico della regione perforata settale. Nessuno degli 11 pazienti ha al momento dell'osservazione acconsentito alla sospensione dell'abuso di cocaina e pertanto è stato a tutti proposta (accettata da 3 pazienti) una soluzione temporanea del problema della perforazione con il posizionamento di un bottone di silicone a chiusura della stessa, al fine di migliorare il flusso aereo nasale e ridurre la progressione della necrosi locale. Si descrivono alcuni dettagli di tecnica chirurgica con l'impiego combinato di acido ialuronico in falde riassorbibili per favorire la cicatrizzazione e la guarigione delle aree mucose cruentate e distrofiche.

PAROLE CHIAVE: Naso • Perforazione del setto nasale • Cocaina • Psicoterapia • Trattamento chirurgico

Introduction

Cocaine is an alkaloid extracted by processes of desiccation and maceration of *Erythroxylon Coca* leaves. Historically, the plant, which usually grows in Peru and Bolivia, is used by Andean population to increase physical endurance. In Western Countries, the use of cocaine, by inhalation, is currently increasing and its use is exceeding that of heroin in the rising generation. Young people of the third millennium use narcotics to distract from the negative conditions of everyday life and to escape in “unreal” trips as happened in the '60s and '70s for the heroin addicted^{1,2}.

Today, on the contrary, people addicted to cocaine want to be more competitive and “winners” and they believe that cocaine can help them to reach this goal. Indeed, due to its stimulating effects on the central nervous system and due to the conviction that cocaine is not a dangerous drug, this narcotic progressively spreads as a form of amusement, at the beginning mostly among the middle-upper class. In the last few years, in big American towns, however, its use has again increased also among the lower classes, because of the spread of crack, an alkaloid-free substance, extracted from cocaine powder (cocaine chlorhydrate), which serves as a base for cocaine, the cost of which is low and can be consumed smoking^{1,3}.

General aspects

One single dose of cocaine to be inhaled is a mean 20-40 mg. Its effects are very subjective and are very difficult to predict. These effects occur within 30-120 seconds, reaching their peak within 15-20 minutes and last about 40-60 minutes, for those taking a single dose and 10-20 minutes for those who smoke (crack). A short time after cocaine inhalation, a rapid drop into normality follows, which is very often felt as unpleasant and depressing, then the subject usually tends to take it again, until cocaine is no longer available. Side-effects of cocaine are numerous and localized in different parts of the body, besides the nasal district. Acute pulmonary oedema, pneumothorax, lung haemorrhage, bronchiolitis, bronchoalveolar hypersensitivity, respiratory distress are some of the respiratory complications related to the abuse of cocaine. Acute myocardial ischaemia, arrhythmia, thoracic pain without myocardial necrosis, thrombosis are only a few of the cardiovascular injuries. Other secondary complications, due to acute intoxication, are cerebrovascular stroke, hyperthermia, convulsions, heart stroke, detachment of the placenta, rhabdomyolysis and acidosis. At neuro-molecular level, cocaine interrupts the neurotransmitters dedicated to re-uptake of dopamine and noradrenalin, increasing their concentration, in the inter-synaptic space, and, moreover increasing their action on the post-synaptic terminals. Its action on the “reward” system (*medulla oblongata*, frontal bridge and cortex), explains the euphoric effects, the hyperactivity and the fact that it easily induces addiction. As soon as the cocaine effects are over, a sharp drop in the dopaminergic activity occurs and then the euphoric effects are immediately followed by a phase of depression (crash). Chronic use of cocaine rapidly leads to development of tolerance, especially in euphoric subjects^{1,5}.

Inhaling cocaine leads to the development inside the nose of ulcerous and necrotic lesions, both in the mucosa and the osteo-cartilaginous area, on account of direct and indirect

ischaemic actions, due to drugs used “to be cut with” the cocaine; during the first ENT visit, it is important to make a careful differential diagnosis, in order to exclude other sinusoidal disorders (granulomas, carcinomas, chronic rhino-sinusitis, lymphomas). Perforations usually become symptomatic for the patients, on account of their diameter and especially when they are located in the anterior cartilaginous portion of the nasal septum, as they induce epistaxis, infected scabs, nasal obstruction, heavy and sibilant breathing^{6-9,12,14}.

Psychological aspects

Cocaine leads to rapid and severe addiction and is a drug which takes to “devotion” eminently. In a short time, cocaine users feel a greater need to take it again, and when doses and frequency increase, the person addicted, cannot live without it. The emotional situation, characterized by intense anxiety and depression with a distressful feeling of inadequacy, leads the addicted, a few hours after former euphoric status, to continue to use cocaine, until his uncontrollable desire to take it explodes, the craving. When its effect vanishes, then comes the “down” phase, which leads the addicted to feeling tired, without energy and depressed. Then, as time passes and, dose after dose, during the “down” phase, he/she doesn't enjoy anything apart from cocaine. Some of the psychological low-term effects are: increase in good humour, euphoria, feeling of intense well-being, loquacity, disinhibition, increase in mental activity and attention, decrease in the feeling of tiredness and pain, in the sense of danger and critical sense, with a high risk of car accidents, alteration of visual and tactile faculties, weakness of emotion, insomnia and anorexia. Moreover, some of the long-term effects of cocaine abuse are: anxiety, hyper-reactivity to external stimuli, aggressiveness, loss of self-control, depressive syndromes, psychotic disease, sexual disorders^{11,12}.

We report the results of a two-year observation period focused on a consecutive group of patients, habitual users inhaling cocaine, who have been evaluated and undergone both psychological and otorhinolaryngological treatment, in order to analyse their characteristics and the possibility of solving their problems.

Materials and methods

Overall, 104 patients (75 male, 29 female, aged between 16 and 54 years), all habitual inhaling cocaine users (≥ 10 times per month) have been observed for 2 years. Of these, 11 (10.5%) had nasal septal perforation, which is a frequent complication related to cocaine use. Of these 11 patients, 8 (72.7%) had nasal septal perforation of the quadrangular cartilage, while in the other 3 (27.3%) the perforation involved also the bony tract (vomer-perpendicular ethmoidal lamina). All patients with nasal septal perforation underwent, at TO, rhino-endoscopy with 0°, 45° endoscopes (in order to explore both the nasal cavity and the paranasal openings), computed tomography (CT) scan of nose and paranasal sinuses (in order to check bone erosions and condition of the sinuses) (Fig. 1). All patients received “as needed” therapy with saline solution, thermal water nasal spray and oily emollient drops. At the time of the observational period, none of the 11 patients presenting nasal sep-



Fig. 1. Ct scan showing bone erosion and phlogosis.

tal perforation agreed to stop abuse of cocaine; therefore, a temporary solution was offered to all the patients (accepted by 3), i.e., the positioning of a silicone button (Septal-Button, Atos Medical, Horby, Sweden) to close the perforation and thus improve the air flow in the nose and reduce progression of local necrosis. We positioned, under local anaesthesia (Lidocaine 10%, AstraZeneca, Sodertalje, Sweden), together with the button, two layers, per septal side, of hyaluronic acid at different levels of esterification, kept in position by the button, as a “sandwich”, in order to obtain better re-growth of the mucosa and less scabs and bleeding (Sinil and Laserdrum, Xomed, Jacksonville, USA). These 3 patients also underwent biopsy with histological examination of the septal perforated region at T0 and after button removal at T1.

All 104 patients enrolled in the study were submitted to a psychological analysis concerning the motivations that induced them to use cocaine. All of them were included in psychological-evaluation interviews; during this examination, the MMPI (Minnesota Multiphasic Personality Inventory) questionnaire was administered to all patients. The MPPI questionnaire is a tool elaborated to evaluate the most important structural characteristics of the personality and related emotional disorders. With the MPPI, a psychological picture can be drawn from the psychopathological point of view, and, moreover, with this questionnaire, subjects not presenting psychic or psychiatric disorders can be analysed.

It is easily administered and thanks to its easy reading and comprehension, only a quite simple grade of education is necessary.

The questionnaire in use, at present, MMPI-2, consists by 567 items and, for each of these, those interviewed have to give standard answers, true or false.

MMPI-2 concerns 3 scales of validity and 10 clinical scales, developed by Hathaway and McKinley, which are organized into 2 groups: validity indicators and clinical measures¹³.

Results

After 2 years, when removed, the silicone button, positioned in the 3 patients, had led to re-growth of the mucosa

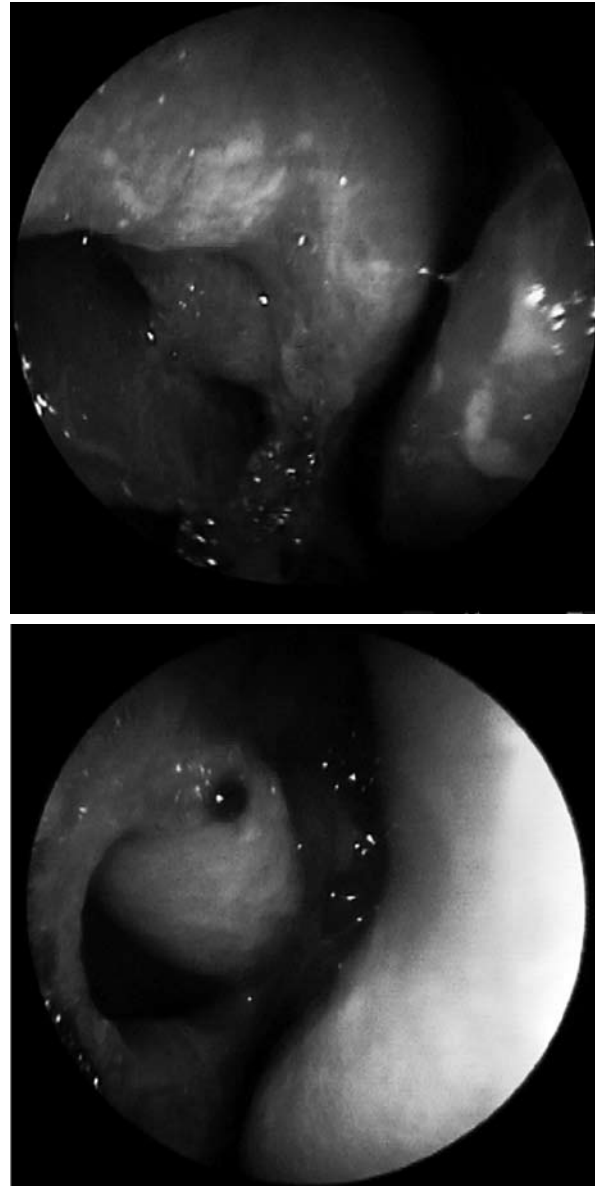


Fig. 2. Rhinoscopy at T0 and T1 shows mucosal healing and fewer scabs.

in the perforated region, resulting in healing of the damaged tissue (Fig. 2). No infections or discomfort were reported at 2-year follow-up. T1 CT and rhinoscopy, compared with T0, showed, in the 3 patients, reduction of nasal septal perforation and improvement of the trophic condition of the nasal mucosa covered by the button, also at T1 histological examination (Figs. 3, 4).

Psychological analysis was performed in all 104 patients: 62 patients (59.6%) answered that they inhaled cocaine to improve endurance and to feel stronger and less tired; 34 patients (32.7%) to enjoy themselves more during parties and to communicate more effectively with other people; 5 patients (4.8%) to gain confidence and to overcome their shyness, 2 patients (1.9%) to improve their sexual performance and 1 patient (1%) to be able to drink more alcoholic drinks for a longer time without feeling sleepy. All the patients underwent psychotherapeutic treatment, but due to the poor compliance and constancy in attending the scheduled follow-up visits it was possible to complete treatment

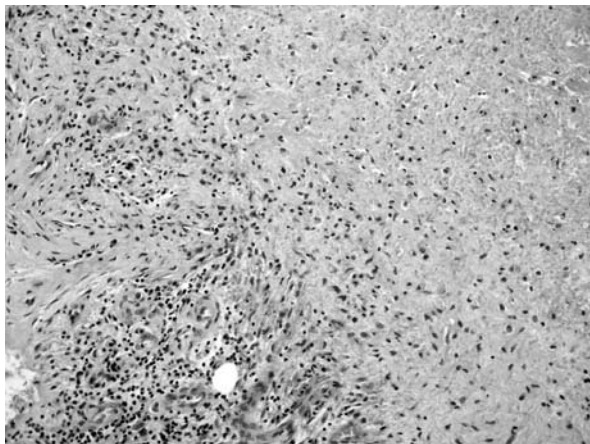


Fig. 3. Necrosis of nasal mucosa at T0, with granulation tissue (200x).

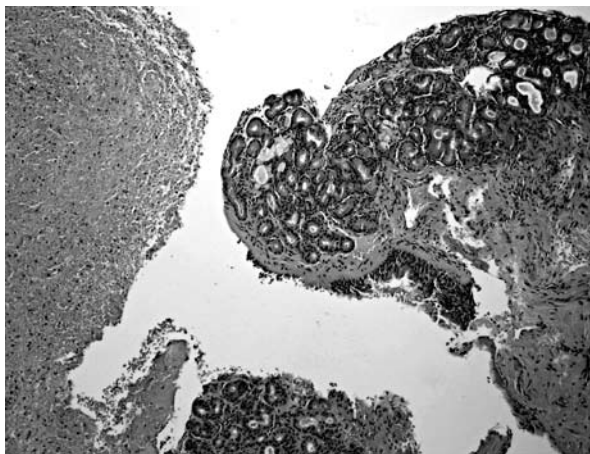


Fig. 4. Healing areas of nasal mucosa after removal of septal button (40x).

in only 16 of the patients (15.3%), all of whom now clear of cocaine addiction.

Discussion

The theory that addiction and/or abuse of substances may be associated with psychiatric disorders is spreading more and more in the scientific areas which work with addiction.

Psychiatric disorders may precede, be associated with, or follow the use of substances; between the two conditions of psychopathology and abuse, a relationship can exist from time to time, of “self-care”, chance or simply association⁵. Moreover, it should be stressed that not always can asserted psychiatric pictures be associated with diseases due to the use of substances; in fact, they are often borderline conditions, i.e., between behavioural disorders, concerning the relational and emotional field, and psychopathological diseases, which appear to be involved in an “equilibrium” situation, even if temporary, with drug addiction.

Among the aspects linked to cocaine use, the most frequent are those referring to disorders concerning difficulty in the regulation of emotional-affective life.

In particular, the narcissistic disorder of the personality seems to be a risk factor for the abuse of this substance and

it is proven, in many studies, also in 30% of the cocaine addicted. These kinds of patients suffer a greatness mania (in their imagination and behaviour), need to be admired, loss of empathy and ability to acknowledge and identify feelings and need of others^{3 4 12}.

Cocaine easily and rapidly leads to intense addiction and is considered a drug which takes to “devotion”. Very rapidly, the need to take it again increases until the time comes when, if doses and frequency continue to rise, the person addicted, cannot live without it. The emotional situation, characterized by intense anxiety and depression with a distressful feeling of inadequacy, following a few hours after the earlier euphoric status, leads the addicted person to continue using cocaine, until his/her uncontrollable desire to take it explodes, the craving^{1 3}.

Medical treatments for nasal septal perforation include nasal sprays with washing and humidifying action, oily and vitaminic emollient drops, nasal eutrophic ointment; albeit, none of these are able to close the perforation and only help the patient to better tolerate the discomfort of scabs and dryness.

Many surgical reparative treatments have been described, but failures due either to re-perforations or infectious complications, that have a negative effect upon the perforation, results in these surgical techniques not being easily accepted either by the patients or the surgeons^{10 11 14}.

Hyaluronic acid, used in 3 of our patients, is a natural polysaccharide, abundant in: the extracellular matrix (skin, gums), aqueous humor of the eye, synovial fluid of the joint. Hyaluronic acid devices have been developed and successfully used in other areas of the body (eye surgery, synovial fluid replacement, wound healing, burns, abdomino-pelvic surgery) and in rhinosurgery, as nasal dressing and sinus stent (Sinil, Xomed, Jacksonville, USA). Hyaluronic acid, following esterification in thin sheets, used inside the nose, accelerates healing of the mucosal lining, is easy to insert and handle, it disintegrates thus not requiring removal, is biocompatible and leads to a more rapid return of normal muco-ciliary function. In its dry state, it is a hygroscopic, white, non-woven material. It expands as it absorbs up to 10 times its weight in liquids and assists in controlling minimal bleeding. As it absorbs fluids, it gradually changes into a muco-adhesive gel and eventually complete natural degradation (3-5 weeks), providing excellent stenting properties to separate the mucosal surfaces and contribute to prevention of adhesions.

An other esterification and modification process of hyaluronic acid leads to a very thin slice with thousands of laser microperforations (40 micron diameter) (Laserdrum, Xomed, Jacksonville, USA). These microperforations are colonized by live cells from the borders of septal perforation, which contributes to the repair of mucosa damage.

Great difficulties were observed in the integrated ENT-psychological treatment, due to bad compliance of this kind of patients, and because they refuse to stop inhalation of cocaine. For this reason, it is very important to bear in mind the advantage of the septal button together with hyaluronic acid in order to obtain better re-growth of the nasal mucosa, with a mechanical protection of the septum, and with a reduction in local mucosal necrosis. Application is easy, under local anaesthesia and in the day-surgery setting.

Hyaluronic acid, kept in place by the septal button, as in our technique described herewith, proved to be effective

in the reduction of granulation tissue formation, to contribute to more rapid perforation border healing, to display a haemostatic effect and to dissolve by itself without requiring removal. Probably both the mucosal mechanical protection of the button from inhaled cocaine erosion, together with the properties of hyaluronic acid led to a better healing process.

Overcoming cocaine addiction is very difficult and painful: the person addicted may go through a period of deep

depression, complete loss of energy, loss of appetite, insomnia and it is not unusual for him/her to become a maniac of persecution, wanting to kill him/herself and becoming psychotic. In conclusion, it is important that during the detoxication process, the subject be supported both by pharmacological and psychological treatment integrated with ENT treatment; for this reason, following the first evaluation of the patients, all were enrolled for psychological treatment as a support.

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Received May 26, 2008 - Accepted: August 31, 2008