COMPARTMENT SYNDROME AND DRUG ABUSE

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This report explains the clinical and analytical changes found in three heroin-addicted patients who developed a compartment syndrome of the leg and of the gluteus medius and tensor compartments.

Keywords : compartment syndrome ; drug abuse.
Mots-clés : syndrome des loges ; toxicomanie.

INTRODUCTION

The increasing incidence of drug addiction in our population causes cancers for such patients suffering either from pathologies directly derived from their addiction or characteristic pathologies for which a correct diagnosis and treatment depend on accurate identification in this special group.

The complexity of such patients requires the aid of specialists in several disciplines.

The goal of this report is to evaluate the degree of compartment syndrome in these patients as well as the level of kidney injury developed, all in relation to the delay in the correct diagnosis.

To do this we observed three heroin-addicted patients who developed a compartment syndrome of the inferior extremities after remaining for a long period in the decubitus position, owing to overdose.

MATERIALS AND METHODS

Between 1987 and 1989 we admitted to hospital three heroin-addicted patients who developed a compartment syndrome, involving the leg in two cases and the gluteus medius and tensor compartment in one case.

The three patients were males aged 19, 22 and 24 respectively, who had been addicted to heroin for periods ranging from 2 to 4 years, and in all of them we found no previous trauma but the limb compression caused by lying 6 to 12 hours in lateral decubitus position in an obtunded state caused by heroin overdose.

All of them were referred from other local hospitals for treatment of acute kidney failure in our hemodialysis unit.

In all cases we took into consideration the amount of time needed to make the diagnosis and to carry out subsequent surgical treatment. We also monitored the degree of kidney injury by the values of creatinine and urea in their blood, and by the amount of time they needed to undergo the hemodialysis treatment to maintain correct kidney function. We also used a blood pressure catheter (1, 6, 8) type Rocher 202 (fig. 1) consisting of a central unit to inform us of the medium pressure of the compartment explored as well as to let us know the maximum and minimum pressure in case of intra-arterial measurement of them. To this central unit we connected a catheter with a pressure oscillation sensible membrane which was fitted to a one use catheter set with a 20 mm gauge at the end for the puncture of the compartment. We use this set in the emergency area in order to have strict control over the levels of pressure in the different compartments and are able to do surgical decompression at the most precise moment.

RESULTS

All the patients on admission to our hospital were affected in general with metabolic acidosis, acute kidney failure and high levels of creatinphosphokynase in their blood.

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Table I. — Clinical and analytical findings of the 3 patients

	Hemodialysis days	Compartment involved	Time of delay	Skin closure	mmHg
Patient 1	23	antero-extern	2	secondary	69
Patient 2	25	four of the leg	4	secondary	58
Patient 3	-	gluteus	2	primary	35

Patient 1 (table I) developed a compartment syndrome of the antero-extern compartment of his leg, showing, when he was moved to our hospital, swelling and pain of the injured leg, and hypoesthesia with paresia of the level of the lesion.

Patient 2 developed a compartment syndrome involving the four compartments of his right leg, with swelling and severe pain. We found a total anesthesia and paralysis of the territory affected in a way that no technical anesthetic was needed to perform surgical decompression.

Patient 3 showed compartment syndrome of the gluteus medius and tensor compartment, showing a moderate swelling of the gluteus medius with pain and weakness of the left inferior extremity.

The amount of time lost between their admission to the first hospital and their later move to our hospital where they were reoriented and found to have a compartment syndrome, was between 2 and 4 days.

We controlled the compartment pressure of all three patients by the blood pressure catheter, which gave us values of 69 and 58 mmHg in the anterior compartment of the leg of patients 1 and 2, and of 35 mmHg in the gluteus medius and tensor compartment in patient 3.

Patients 1 and 2 needed hemodialysis treatment during 23 and 25 days respectively in order to keep their kidney functioning.

The three patients underwent surgical decompression of the compartments involved, and in patients 1 and 2 we had to delay the closure of the wounds doing an every day approach with wire safety cords. The wound of patient 3 could be closed primarily (fig. 2).

Once surgical treatment was performed, creatinphosphokinase level stayed high for 9 days.

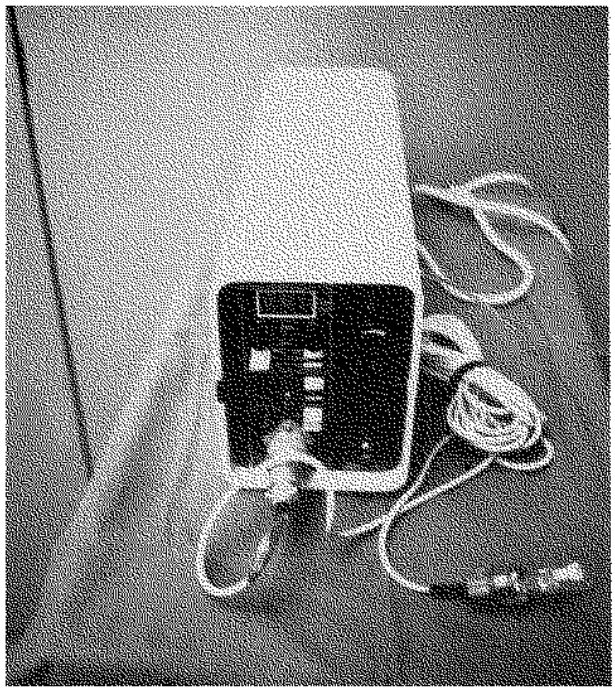

Fig. 1. — Blood pressure catheter.

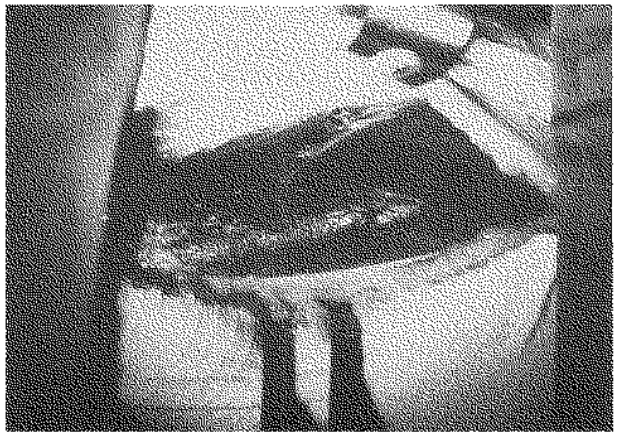

Fig. 2. — Severe affectation of muscle in patient 3.

DISCUSSION

Due to the systemic effect of drug abuse, and to its relatively recent spreading in our country, we are able to see how these patients frequently show special clinical features in which the correct diagnosis is sometimes hard to find.

Every day the admission to emergency areas of patients in a comatose state because of drug overdose becomes more usual. These patients are initially controlled by the internal resident, because of the systemic disturbance that they show, which is often only secondary to the systemic changes induced by drug abuse (2, 3 and 4), but that sometimes can hide other clinical entities developed under the prolonged decubitus in a comatose state such as compartment syndromes.

It is well known that compartment syndromes are difficult to recognize in comatose patients, and often remain undetected at first, loosing all the therapeutic measures taken to restore the general function of the patient.

Sometimes it is hard to make the correct diagnosis because the compartment involved is a non-usual compartment, like the gluteus. In the gluteus compartment syndrome, clinical examination only reveals minimum swelling of the affected zone, with weakness of the extremity involved. Only with an exhaustive anamnesis and an accurate clinical examination can we conclude that this compartment is affected.

It is also known that heroin can bring about kidney injuries such as glomerulonephritis secondary to immunologic mechanism or secondary to sepsis or endocarditis. Because of all the above, this group of patients easily develops acute kidney failure secondary to the rhabdomyolysis produced in a compartment syndrome, and only the surgical decompression and hemodialysis lead them to a normal kidney function. It is to be noted that although the levels of creatinphosphokinase in their blood decrease quickly to normal values, the kidney function of these patients had to be controlled by hemodialysis for several more days.

CONCLUSIONS

Based on the references consulted we have found that the patients addicted to heroin who develop a compartment syndrome suffer a significant delay in their diagnosis and subsequent surgical treatment, probably due to the interposition of pathologies found on them that require the participation of several specialists.

In this way we have also found that these patients developed acute kidney failure more easily than other patients who feature compartment syndrome of other etiologies. We have come to the conclusion that the delay in the diagnosis of these patients favours an extense myonecrosis which is responsible for the important increase of myoglobinuria toxin in the kidney. Thus the previous kidney injuries already present in these patients addicted to heroin can also favour kidney failure.

Considering what has been said above, the clinical examination must be thorough in these patients, taking into consideration all the ethiological factors present in them. Never forget that drug overdose puts the patient in a comatose state for several hours, and a compartment syndrome can be the main cause of all the disorders found in them after a drug overdose. If the compartment syndrome is not recognized in this heroin addicted patient, and the surgical treatment is not immediately begun, several injuries to the kidney and other organs can develop.

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SAMENVATTING

C. TORRENS, M. MARIN, C. MESTRE, A. ALIER, X. NOGUES. Logesyndroom en toxicomanie.

De auteurs beschrijven de klinische en biologische afwijkingen, vastgesteld bij 3 heroïne-toxicomanen, die compartiment-syndromen vertoonden, respectievelijk aan het onderbeen, aan de gluteale streek en in het lateraal compartiment van de dij.

RÉSUMÉ

C. TORRENS, M. MARIN, C. MESTRE, A. ALIER, X. NOGUES. Syndrome des loges et toxicomanie.

Les auteurs décrivent les altérations cliniques et biologiques constatées chez 3 héroïnomanes, qui présentèrent un syndrome des loges de la jambe, de la région fessière et de la face externe de la cuisse.