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Comparison of surgical methods in catastrophic antiphospholipid syndrome (CAPS)

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SUMMARY: **Comparison of surgical methods in catastrophic antiphospholipid syndrome (CAPS).**

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Antiphospholipid syndrome (APS) is an autoimmune condition characterized by vascular thromboses and/or pregnancy morbidity in the presence of antiphospholipid antibodies. The variant "catastrophic" (CAPS) is defined as a potential life-threatening disease, characterized by multiple small vessel thromboses that can lead to multiple organ failure. Surgery is between precipitating factors in CAPS International Registry, but it's still unclear the relationship between surgery and syndrome.

The present study reports two surgical procedures, performed on two patients with APS admitted with diagnosis of loss of substance of the lower limb needing of reconstructive treatment. We compared and analyzed aggressive and minimally invasive surgery.

RIASSUNTO: **Confronto tra metodi chirurgici nella sindrome catastrofica da antifosfolipidi (CAPS).**

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La sindrome da antifosfolipidi (APS) è una condizione autoimmune caratterizzata da trombosi vascolari e/o morbidità gestazionale in presenza di anticorpi antifosfolipidi in circolo. La sua variante indicata come "catastrofica" (CAPS) è definita potenzialmente letale e caratterizzata da trombosi multiple dei piccoli vasi che portano all'insufficienza multiorgano. Il "CAPS International Registry" include la chirurgia tra i fattori precipitanti ma non è stata ancora chiarita la relazione tra chirurgia e sviluppo di CAPS.

Il presente studio riporta due procedure chirurgiche, eseguite su due pazienti affetti da APS con diagnosi di perdita di sostanza dell'arto inferiore con necessità di intervento ricostruttivo. Si fanno una comparazione ed un'analisi retrospettiva tra chirurgia invasiva e mini-invasiva.

KEY WORDS: Catastrophic antiphospholipid syndrome - Reconstructive surgery.
Sindrome catastrofica da antifosfolipidi - Chirurgia ricostruttiva.

Introduction

AntiPhospholipid Syndrome (APS) is an autoimmune condition characterized by vascular thromboses and/or pregnancy morbidity in the presence of antiphospholipid antibodies (aPL). Catastrophic Antiphospholipid Syndrome (CAPS) is an accelerated form of APS. This variant "catastrophic" is defined as a potential life-threatening disease, characterized by multiple small vessel thromboses that can lead to multiple organ failure (MOF) and death (1). This devastating disease with a poor prognosis shows important differences with the more frequent APS. It seems to be the unusual involvement of large arterial or venous vessels and the microvascular involvement affecting multiple organs, as its main feature. Moreover the thromboses in CAPS are frequent and diffused. In fact disseminated intravascular coagulation (DIC) in CAPS can result in MOF and increased morbidity and mortality up to 50% (2, 3).

The pathophysiology of CAPS is not clear. Harris suggests that APS patients remain disease free for a long time even if the antibodies persist in blood so, probably it needs a *second hit* that triggers thrombosis at that site (4). In case of CAPS, precipitating factors may involve several sites in small vasculature resulting in wide-spread thrombosis. The precipitating factors contributing to the development of CAPS may be various: immune mechanisms, drugs, postpartum period, infections, anticoagulant therapy withdrawal, etc.

The aim of this paper is to report the development of CAPS after surgical procedure, and to described two cases to help evaluating if the surgical treatment is correct at

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any rate or if it can represent a trigger to develop a massive throembolism in CAPS sensitive patients. We perform two surgical procedures in two patients with APS that were admitted with diagnosis of loss of substance of the lower limb, needing of reconstructive surgical treatment. We compared and analyzed aggressive and minimally invasive surgery.

Case reports

Case 1 - Aggressive surgery.

In June 2002, a 35-years-old-woman, Italian Caucasian, already treated for break of femoral artery caused by vascular recurring catheterism. Physical examination highlighted groin-thigh massive loss of substance (10x4 cm) exposing vascular by-pass (Fig. 1). Patient was anamnesis positive for APS and familiar vascular disease. Laboratory values profile on admission showed elevated: partial thromboplastin time 80.56 sec, RATIO 2.01, fibrinogen 715 mg/dl, and D-dimer 3200 which reached sixteen time higher then normal range (<200), FDP high, INR 2.74, PT 34.7 sec.

At our Department, patient underwent to reconstructive surgical procedure by tensor fasciae latae flap to protect femoral prosthesis, to achieve a suitable vascular patch covering, and to cover the groin wound (Fig. 1).

In postoperative days patient showed a triggered CAPS with high fever and a multiorgan failure characterized by arterial and venous thrombosis that leaded the patient to death for DIC, despite successful surgical outcome.

Case 2 - Minimally invasive surgery.

In June 2002, 69-years-old-man, American Caucasian, smoker, was admitted to our Department with diagnosis of politrauma involving head, trunk (ribs multiple fracture), and right lower limb characterized by bone fracture of left tibia and fibula and moreover necrotizing fascitis of right groin area with massive haematoma, and abdominal left region. Physical examination highlighted multiple eschars on groin region (12x10cm) and on left hip (10x8cm and 3.5x1.5), all of them stocked to the below tissues (Fig. 2). Patient was positive for anamnestic familiar vascular disease, hypertension and cerebral haemorrhage. In 1994 patient was diagnosed APS, associated Addison disease and senile epilepsy. In 1995 he underwent right lower limb distal amputation for an acute and massive ischemia, and introduced anticoagulant oral therapy and cortisone based drug. Laboratory values profile on admission showed elevated: partial thromboplastin time 85.56 sec, fibrinogen 883mg/dl, and D-dimer 4111 which reached twenty times higher then normal range (<200), INR 3.74, PT 45.7 sec.

We had two possibilities: to harvest two covering flaps or simply to perform groin and abdomen escharectomy without covering by soft tissue groin flap. Patient was introduced to escharectomy (Fig. 2) without the harvest of flaps. At 48 months follow-up patient remained disease free.

Discussion

According to literature and international consensus, APS is an autoimmune condition characterized by vascular thromboses and/or pregnancy morbidity in the presence of aPL (5). In 1992, the "catastrophic" variant was first defined as a potential life-threatening, characterized by MOF and DIC (6, 7). In 2003, the eponym "Asherson's syndrome" was attached (8). Due to the diversity of clinical and serological presentations, an international consensus on classification for CAPS has been developed (9). Fortunately, CAPS is an unusual form of presentation that represents less than 1% of the APS cases. However, patients with CAPS usually face a life-threatening situation. The mortality rate was about 50% in the largest published series (10). Another specific characteristic of CAPS is that 60% of patients appear to have a triggering factor, especially infections, the commonest identifiable trigger for CAPS, present in about 25% of cases. Moreover, multiple triggering factors may be present in the same patient (11).

Surgical procedures are included between precipitating factors in CAPS International Registry (12), but it's still unclear the relationship between surgery and CAPS development. We performed two different surgical procedures. One patient underwent invasive surgery with reconstructive procedure by tensor fasciae latae flap. Other patient underwent conservative treatment with minimally aggressive surgery consisted only in escharectomy. They both required covering but in the second case we chosen to be aggressive as little as possible; we wouldn't trigger an uncontrolled reaction like first case. Conservative treatment seems to be the *goal* that avoids the onset of CAPS. On the contrary, we believe that the more invasive surgery in the first case has been the *triggered hit* of CAPS, or rather the precipitating factor, maybe by producing of a massive and acute inflammatory response.

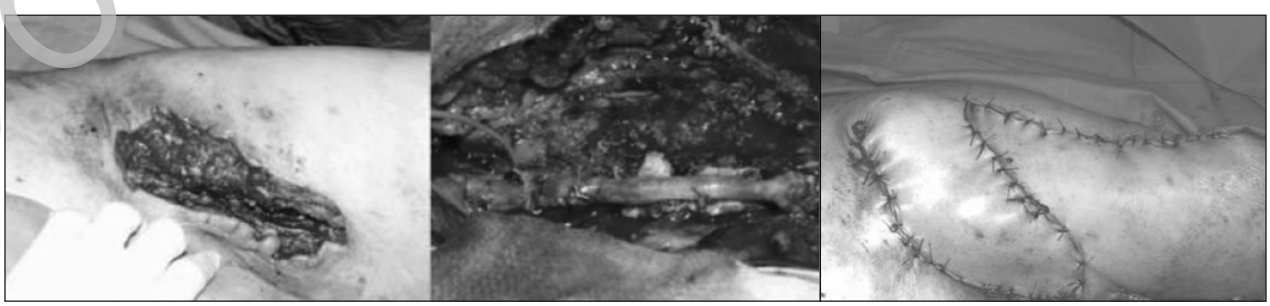

Fig. 1 - Case 1. Groin-thigh wound with by-pass exposition and reconstruction by tensor fasciae latae flap.

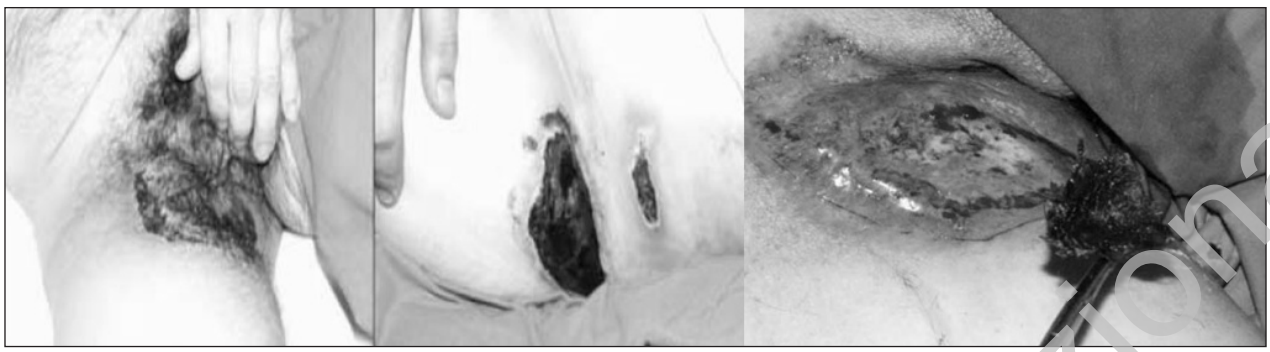

Fig. 2 - Case 2. Eschar on right groin region and on left hip region, and escharectomy.

In the reported cases, laboratory's values pointed out serum high levels of fibrinogen degradation products and high level of coagulation factors. These values are related to a blood hypercoagulability state, that expose patients to a higest risk of vascular occlusion for thrombotic manifestation. Same conservative medical treatment but different surgical procedures influenced dramatically the prognosis of the patients. In fact, in the second case not invasive and not really aggressive surgery characterized by only escharectomy of the necrotized tissues warranted the *quoad vitam* prognosis, avoiding CAPS developing. Otherwise, first patient, treated medically by the same anticoagulant therapy, underwent invasive surgery with involvement of soft tissues and vessel structures that developed fulminant course of CAPS with multiple thrombi and following MOF that leaded in few days patient to death.

Conclusions

We believe that in a hypercoagualable state as APS, conservative minimally invasive surgery, characterized by just a surgical debridment of the necrotis areas and supported by a medical treatment associated to long-term and continuative anticoagulant therapy, must be chosen as management in these patients. We believe that this patient's management avoids the *triggered hit* mechanism of CAPS that develops a massive throembolism in sensitive patients, a highest risk state for patient's life with a very poor *quoad vitam* prognosis.

In conclusion, surgery is between precipitating factors in *CAPS International Registry*, however we suggest that the surgery is possible and correct if it's minimally invasive, as well as our case that didn't link to CAPS development. So, a prompt and easy treatment may prevent and resolve lethal complications caused by this devastating syndrome.

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