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Review

Peripheral septic arterial embolism of non-cardiac source: A systematic review of literature

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ABSTRACT

Peripheral septic arterial embolism of non-cardiac source (NCPSRE) is a rare event, and scientific literature is scanty. The objective of this paper is to carry out a systematic review on this topic. *Materials and methods*: a computerized search was conducted using PubMed from 1946 to 2014. *Results*: A total of 43 papers describing 53 patients were identified. *Staphylococcus aureus* was the most frequently involved germ in the infection (32/53 cases). The most frequent cause was arterial complications after catheter insertion for therapeutic or diagnostic procedures (29/53), followed by complications of previous vascular bypass (8/53) and aspergillosis (10/53). Diagnosis was made essentially through blood culture (35/53 cases) and biopsy of skin lesions (15/53). A specific antibiotic therapy was helpful in the majority of patients (35/53) and 36/53 patients underwent surgical procedures. Eleven patients died: seven of these were affected by aspergillosis; two cases were recorded during surgery; another two patients died of different causes. *Conclusions*: NCPSRE should always be suspected in patients who have undergone invasive diagnostic and therapeutic vascular procedures, in patients submitted to radial artery catheter insertion, in cases of aortofemoral bypass followed by gastro-intestinal bleeding, in patients presenting sudden acute ischemia of the lower limb, accompanied by fever, leukocytosis, cutaneous petechiae or purpuric macules or a painful mass associated with a pseudoaneurysm at the site of a catheter insertion. In immunocompromised hosts, NCPSRE may indicate a diagnosis of aspergillosis, and a skin biopsy and chest X-ray should be performed promptly.

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Introduction

Peripheral septic arterial embolism (PSRE) recognizes a cardiac source in most cases, while non-cardiac sources are rarely described in literature. The severity of non-cardiac PSRE (NCPSRE) is variable, ranging from mild diseases to a life-threatening condition. NCPSRE may be a complication of many pathological

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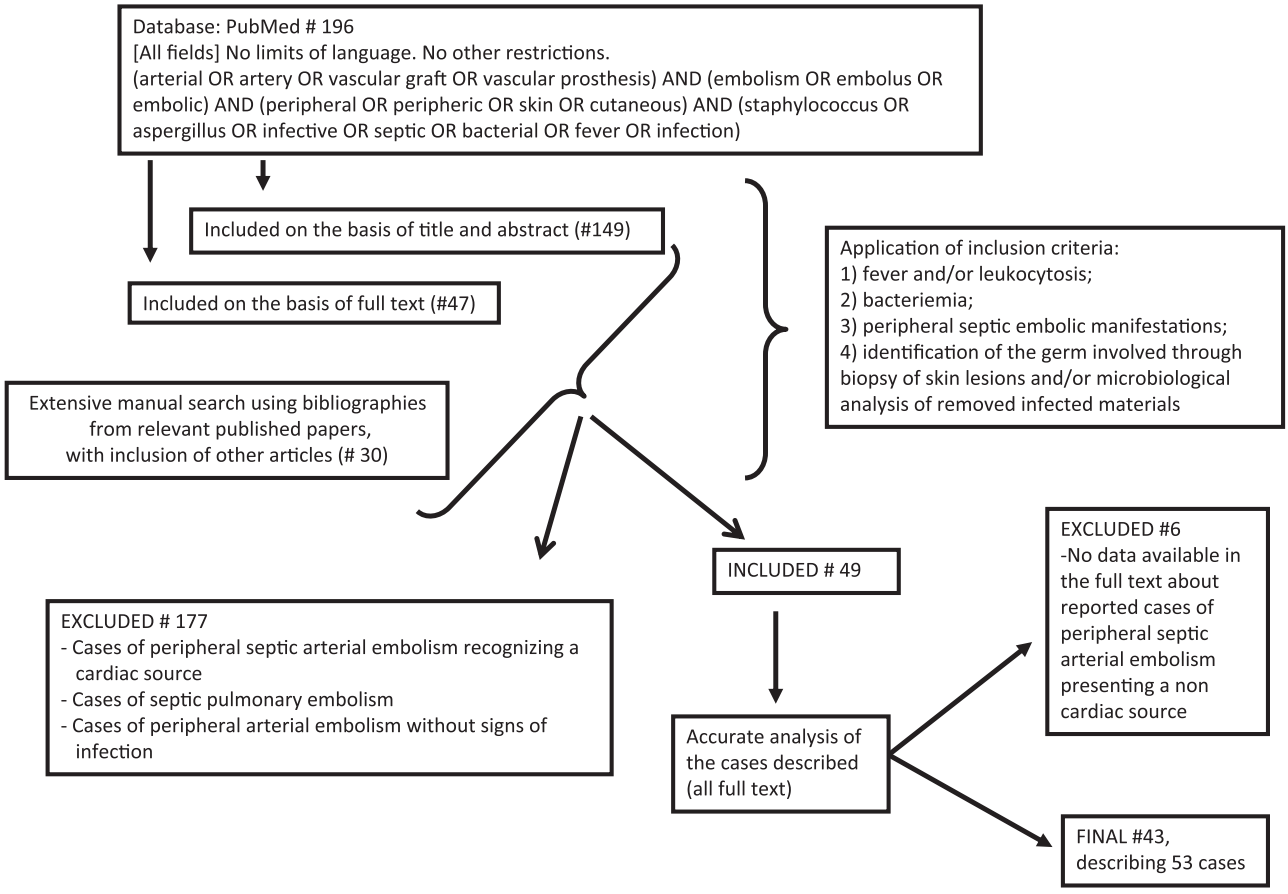

Fig. 1. Flow chart summarizing the literature research approach (#=number of articles).

conditions. Diagnosis is difficult to achieve and is essentially based on clinical manifestations, skin biopsy and blood culture [1–9].

There is little written on this topic, which led us to conduct a systematic review of literature on NCPSRE.

Literature search strategy

A computerized search was conducted through PubMed without limits, combining the following terms "(arterial OR artery OR vascular graft OR vascular prosthesis) AND (embolism OR embolus OR embolic) AND (peripheral OR peripheric OR skin OR cutaneous) AND (staphylococcus OR aspergillus OR infective OR septic OR bacterial OR fever OR infection). In addition, an extensive manual search was carried out using bibliographies from relevant published papers. The selected papers were reviewed by two independent authors (M.M. and A.C.) and judged by their relevant contribution to the subject of this study. An article was considered eligible for inclusion in the systematic review if it reported detailed data on clinical manifestations, source of peripheral embolism, germ involved, type of treatment and outcomes.

Peripheral septic arterial embolism was defined as requiring a combination of three of the following four conditions: (1) fever and/or leukocytosis; (2) bacteriemia; (3) peripheral septic embolic manifestations (purulent arthritis; acute ischemia of a lower or upper limb; skin lesions: pustular rash, purpuric macules and papules, petechiae; subcutaneous nodules on the legs and arms; subungual hemorrhages; Janeway microembolic lesions, Osler's nodes); and (4) identification of the germ involved through biopsy of skin lesions and/or microbiological analysis of removed infected material during surgery or arthrocentesis.

A flow chart summarizing the literature research approach is reported in Fig. 1.

Results

PubMed search identified 196 papers published from 1946 to March 2014; a scrupulous analysis of which resulted in 43 eligible articles describing 53 patients with NCPSRE. Data regarding demographic characteristics, clinical manifestations, embolic sources, germ involved, therapy adopted and outcomes of the analyzed patients are analytically summarized in Table 1.

Among the 53 patients considered (32 males, 21 females), with a median age of 51.5 years (range: 0–78 years), 5 were children <10 years. *Staphylococcus aureus* was the most frequently involved microorganism. Ten patients were affected by aspergillosis.

Embolic sources are listed in Table 2. The most frequent cause was arterial complications after catheter insertion for therapeutic or diagnostic procedures (29/53), followed by aspergillosis (10/53) and complications of previous bypass (8/53). Rare embolic sources included mycotic aneurysms of peripheral arteries reported in two cases, and suppurative granuloma of the oral cavity, floating thrombus of the descending aorta and chest infection of unknown origin, each, in one case. The source was not recognized in one patient.

The most frequently reported clinical manifestations were represented by peripheral septic skin manifestations (44 cases) (livedo reticularis, purpuric macules; Janeway lesions or Osler's nodes), fever and/or neutrophilic leukocytosis (44 cases), purulent arthritis and/or osteomyelitis (17 cases), acute ischemia of a lower limb (5 cases). Rare manifestations were splenic infarction and diarrhea, that occurred respectively in one and two cases; gastro-enteric bleeding