Giant Perigraft Seroma after Axillobifemoral Bypass for Leriche’s Syndrome: A Case Report

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Perigraft seroma is a rare complication that occurs after placement of any vascular graft. It is defined as the collection of a sterile, clear and acellular liquid around the prosthesis. It can appear years after surgery as a soft, palpable and painless mass. We present a perigraft seroma occurred in a 75-years patient underwent Dacron right axillo-bifemoral bypass for Leriche’s syndrome. Ultrasound and computed tomography scan revealed involvement of graft left branch and bifurcation. Although several treatment options have been proposed, removal and replacement of prosthetic affected tract with another of a different material has been proved the choice with best result.

Keywords: perigraft seroma, bypass complication, surgery

Introduction
Perigraft seroma (PS) is a rare complication defined by Blumenberg et al. as “the accumulation of non-infected fluid around an implanted arterial prosthesis.” It can occur with any type of prosthesis, although it occurs more with Dacron and ePTFE grafts, positioned with extra-anatomic course and in the lower limbs. Pathogenetic factors, real incidence and therapeutic choices are not yet clarified. The appearance may also occur after years from surgery. We present a rare case of large symptomatic PS occurred in a 75-year-old patient underwent right axillo-bifemoral bypass (AxBF) for Leriche’s syndrome.

Case Report
A 75-year-old man presented with a history of gradual increase of lower abdominal quadrants globosity (Fig. 1A), recently aching by coughing. The patient had a history of chronic obstructive pulmonary disease (COPD), carotid artery stenosis under medical treatment, alcoholism, previous cholecystectomy, left hip prosthesis and Leriche’s syndrome treated by right AxBF bypass (Dacron 8 mm) performed two years earlier. After surgery, two hospitalizations for suspected prosthetic infection had occurred, treated conservatively. Physical examination revealed a not tender and pulseless suprapubic mass, not associated with skin alterations, and a good bypass pulsatility until its entry into the abdominal mass. The patient was afebrile with blood tests within the limits. Color duplex ultrasound scan (CDUS) disclosed perigraft fluid along the length of the graft.

A CT-scan showed the presence of a 121 mm diameter giant PS, extending from the bypass bifurcation to the anastomosis with the receiving limb (Figs. 1B and 1C). The bypass was entirely patent, although suffering from a right kinking soon after its bifurcation (Fig. 1C) and there were no anastomotic false aneurysms. No visible signs of periprosthetic infection were demonstrated.

The patient subsequently underwent surgical drainage of the mass content (Fig. 2A), removing the capsule (Fig. 2B) containing serous fluid and removing the affected portion of the graft (Fig. 2C), with reconstruction of the contralateral bypass branch in expanded Polytetrafluoroethylene (ePTFE 8 mm).

A portion of seroma capsule was analyzed: macroscopically, the specimen consisted of an irregular flap of periprosthetic wall measuring nearly 10 cm, with irregular and brownish inner and outer surface. Microscopically, periprosthetic wall specimen was composed of fibrous and adipose tissue (Fig. 3A), that showed, at a higher magnification, vascular ectasia, extravasations and chronic inflammation (Figs. 3B and 3C). Adherent to the inner surface of the wall granulation tissue consisting of small caliber vessels and inflammatory infiltrate was present.
Graft porosity is consolidated,\textsuperscript{1,4} remains unclear what are mechanisms that trigger fluid collection. Some authors claim an active role of fibroblasts in the process of peri-prosthetic region remodelling.\textsuperscript{3,5} Since often asymptomatic, in most cases the patient arrives when the seroma has reached large dimensions. Diagnosis is based on CDUS, which assesses graft patency and collection size. During

\begin{figure}
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\caption{(A) perigraft seroma clinical presentation, involving (B) the bifurcation and the femoral-femoral portion of the prosthesis. (C) AxBF bypass ipsilateral leg kinking and detailed seroma dimensions. AxBF: axillo-bifemoral bypass}
\end{figure}

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\includegraphics[width=\textwidth]{Fig_2.png}
\caption{Operative scheme. Bypass portion not removed (green); perigraft seroma pseudocapsule (brown); bypass portion affected by perigraft seroma, removed (red) and replaced (violet); native arteries (blue). (A) Drainage of the perigraft seroma content. (B) Pseudocapsule. (C) Graft portion removed.}
\end{figure}

\begin{figure}
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\includegraphics[width=\textwidth]{Fig_3.png}
\caption{(A) Microscopic examination showed, at low magnification (0.4\times), a thick periprosthetic wall composed of fibrous and adipose tissue with haemorrhage. (B) At a higher magnification (5\times and 20\times respectively), the wall was infiltrated by inflammatory cells such as lymphocytes, it showed vascular ectasia with congestion and red blood cells extravasation. (C) Granulation tissue was also seen, adherent to the inner surface of the wall.}
\end{figure}

\section*{Discussion}

PS is a rare complication that can occur after placement of any vascular prosthesis. The incidence has been estimated 4\% in extra-anatomic bypass\textsuperscript{3} and 0.7\%–0.8\% in anatomic bypass of the lower limbs.\textsuperscript{2,3} Etiology remains controversial. Although the hypothesis of a changing in

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underwent extra-anatomic bypasses, a regular follow-up to highlight the new appearance of possible periprosthetic collections.

Disclosure Statement

The authors have no conflicts of interest to disclose in relation to this study.

Author Contributions

Study conception: DB, MD; Data collection: DB, MD, AD; Analysis: DB, AD, LG; Investigation: DB, MD; Writing: DB, AD; Funding acquisition: none; Critical review and revision: all Authors; Final approval of the article: all Authors; Accountability for all aspects of the work: all Authors

References


Conclusion

PS is a rare complication that needs to be treated resolutely for the high recurrence rate and the augmented risk of graft infection. If symptomatic, surgical therapy is mandatory. Although there are several treatments, only the graft replacement has had satisfactory results. Even after years, we recommend, especially in patients who

treatment planning, especially in case of surgical approach, a CT-scan is helpful to assess extent of seroma, in planning the graft portion to be removed and relations with adjacent structures.

Therapy can be conservative, semi-conservative or surgical. In the first case, the rate of recurrence is high, particularly for large PS. Even in case of semi-conservative treatment (e.g. percutaneous drainage) percentage of relapse remains high, with an increased risk of graft infection. Surgical choice, with affected graft portion explant and pseudocapsule removal, has reported the best results. Although not confirmed by prospective case studies with long-term follow-up, prosthetic material changing (from Dacron to ePTFE and vice versa) has proved to be a practice used by several Authors with good results. Other therapies have been proposed: replacement with homograft or native vein, fibrin glue wrapping, microfibrillar collagen injection into the periprosthetic space. We presented a case of large symptomatic PS after an AxBF bypass. Therapeutic choice was based on several criteria: (1) symptomatic status, (2) important dimensions of seroma, (3) risk of graft infection and (4) outcomes derived by literature. The prosthesis portion surrounded by pseudocapsule was to be necessarily removed in order to minimize the PS recurrence. Microscopic examination revealed cells and microscopic signs of inflammation. Although there are no systemic inflammatory changes, it is probably that fluid extravasation and accumulation are the result of complex reactions and cellular-cellular mechanisms between the foreign body (the prosthesis) and the subcutaneous tissue. After surgery we recommend a close follow-up with CDUS, in order to identify possible recurrence.