Case Report

Xanthogranulomatous pyelonephritis caused by Surgicel in a renal allograft

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Introduction

Surgicel (Johnson & Johnson Medical, New Brunswick, NJ), is a D-glucuronic and D-glucose polymer used as a haemostatic agent [1] to control surgical haemorrhage. Physical interaction between the cellulose and blood gives rise to the formation of thrombi. It is also used in intra-abdominal interventions to reduce the postoperative surgical adherences of the serosa surfaces [2].

Although the manufacturer recommends its removal after use, it is generally left on the wound because of its high level of reabsorption, due to its oxidation capacity. However, cases of histiocytic secondary reactions to Surgicel have recently been described, some of which have been wrongly diagnosed as carcinoma [3].

We report a case of an inflammatory reaction in a kidney allograft secondary to Surgicel which appeared to be xanthogranulomatous pyelonephritis.

Case report

A 41-year-old woman received a cadaver kidney transplant while on prednisone and cyclosporin A therapy. She had been on haemodialysis for 12 years due to membranoproliferative glomerulonephritis. A year later she suffered an acute rejection which responded well to steroids and azathioprine. At this point, pyelocalyceal dilatation and marked thickening of the pyeloureteral mucosa was seen by ultrasonographic examination. The diuretic renogram showed a pseudo-obstructive pattern.

Nineteen months after transplant surgery the patient presented with fever, pain in the allograft, and impairment of renal function. Culture of urine was negative and she was given empirical treatment of pipemidic acid and cefotaxime. Ultrasonographs and CT scan showed hydronephrosis of the allograft and a hypoechoic area around the hilus which extended to the lower pole and proximal ureter (Figure 1). A ‘pig tail’ percutaneous nephrostomy catheter was carried out. Renal function recovered and the signs of obstructive uropathy disappeared. Surgical removal of the ‘pararenal mass’ was unsuccessful. The pedicle of the mass and the allograft were surrounded by fibrous-looking tissue. The intraoperative sample appeared as ‘necrotic-inflammatory tissue’. A second biopsy of the proximal ureter showed fibrosis which obliterated the lumen, epithelial hyperplasia and non specific chronic inflammation.

Faced with the persistence of the pararenal mass, and suspicion of a granulomatous or neoplastic process, extirpation of the renal allograft was performed 22 months after transplantation. The patient returned to the dialysis programme.

Pathology

The surgical sample corresponded to a kidney of $12 \times 8 \times 5$ cm, that showed a fibrous-like mass that surrounded the hilum and the peripelvic fat. This lesion
Inflammatory granulomatous reaction delimited by a fibrous tract. The histiocytic elements, some with clear foamy cytoplasm and others with granular eosinophilic cytoplasm, are mixed together with lymphocytes and red blood cells. A damaged renal tube, which is extended with an area of necrosis, can be observed in this field (arrow) (H&E, ×20).

and PAS-positive inclusions (Figure 4). Numerous vessels showed amorphous PAS-positive material in their lumina, which after ruling out fibrin by the trichomical technique, could be the remnants of Surgicel (Figure 5). The rest of the renal parenchyma showed interstitial fibrosis with patchy tubular atrophy and thickening of the mesangial matrix.

The final diagnosis was of xanthogranulomatous pyelonephritis in the renal allograft, although neither the clinical record nor the macro- and microscopic aspects totally supported the existence of this entity. Therefore we continued to investigate the truth of our findings. In the surgical theatre records, remnants of Surgicel in the vascular structure in the surgical field was described. It is important to note that the second surgical intervention was 22 months after the initial implant.

Discussion

Inflammatory reactions to foreign bodies, secondary to the use of haemostatic sponges, including cellulose
compounds are well known. The so-called ‘retention of Oxycel syndrome’, a product that is very similar to Surgicel, was reported in 1949 [4], describing fatal complications.

Although Surgicel possesses ‘in vitro’ bactericidal properties, and is susceptible to breakdown by endocytosis and enzymatic hydrolysis by macrophages, cases in which Surgicel is not totally reabsorbed, and ensuing bacterial contamination, have been described [5].

Clinically, it may provoke a general ill feeling with a stinging sensation, local pain and occasionally fever. Morphologically we can distinguish two types of lesions. Firstly, those which appear similar to reactions to implants, such as recurrent peritoneal carcinomatosis, although relevant macroscopic alterations may not be present [6]. Microscopically, an abundance of macrophages with intracytoplasmic PAS-positive inclusions are located under the peritoneal surface. A second type is made up of those lesions which appear macroscopically as a ‘mass’ which can be mistaken for an abscess, an inflammatory pseudotumor, or an invasive carcinoma [7]. Histology reveals a granulomatous lesion with abundant fibrosis and foci of necrosis, surrounded by histiocytes and inflammatory elements. Sometimes birefringent material can be found in its interior.

Our case corresponds to this second type of lesion. Initially there was no convincing diagnosis supported by clinical or radiological evidence, although an inflammatory process and malignant neoplasia were considered as differentials. The surgical exploration and the intraoperative biopsy did not shine any light on the matter. At a later date, the microscopic study of the sample suggested an inflammatory-fibrotic process which included the peripelvic fat and the parenchyma of the lower renal pole. Thus the initial presumed diagnosis was that of xanthogranulomatous pyelonephritis versus an inflammatory pseudotumour.

Nevertheless the macroscopic and microscopic evidence did not correspond to an inflammatory renal pseudotumour [8] or to the characteristics of true xanthogranulomatous pyelonephritis [9]. In addition, clinical and radiological studies were not conclusive. One should consider that we were treating a medically immunosuppressed patient and the affected kidney was from a corpse. Moreover, it is rare in renal allografts [10] and we are not familiar with the morphological aspects of this type of inflammatory-infectious lesions in this group.

The key to the diagnosis was found in the surgical report, and therefore we emphasize the importance of adequate communication and interaction between the different professionals involved in the management of renal transplant patients. This is the first report of a secondary inflammatory reaction to Surgicel in a kidney allograft which simulated xanthogranulomatous pyelonephritis. In the future we should bear this possible diagnosis in mind.

References
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