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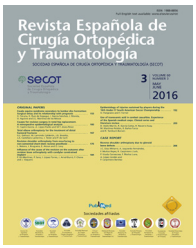

ORIGINAL ARTICLE

Use of grafts in rotator cuff re-rupture☆

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KEYWORDS
Revision surgery;
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Abstract
Introduction and objectives: Rotator cuff re-ruptures appear in 38–65% of cases. In order to reduce this rate, many studies have been performed using different types of biomaterial for purely mechanical aims (re-inforce the suture) and/or biological agents (growth factor transporterts). The aim of this study is to review 22 cases treated with xenografts and analyse various current alternatives.
Materials and methods: A descriptive and retrospective study was conducted using the variables of age, sex, laterality, time of surgery, involvement in MRI, number of anchors, and final mobility results on the Constant and the University of California Los Angeles (UCLA) validated scales.
Results: The study included 22 patients, with a mean age of 51.7 ± 4.6 years. A mean of 2 anchors were used and 13 patients were treated with a porcine intestinal submucosa implant, 6 with equine pericardium, and 3 with porcine dermis. Final results were: 37.6 ± 13 points for the Constant test, and 16.9 ± 3.9 points on the UCLA scale. The follow up was 36 ± 10.2 months.
Conclusions: In our experience, xenografts could provide good functional results and they would be a surgical alternative to tendon transfers in cases of massive tears. Further studies should be conducted with other biomaterials.

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PALABRAS CLAVE
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Utilización de injertos en la reparación de rerroturas del manguito rotador

Resumen
Introducción y objetivos: La rerrotura del manguito rotador aparece en un 38-65% de los casos. Con el fin de disminuir esta tasa se han realizado múltiples estudios que emplean diferentes tipos de biomateriales con fines puramente mecánicos (reforzar la sutura) o biológicos (transportadores de factores de crecimiento). Nuestro objetivo es revisar 22 casos tratados mediante xenoinjertos, así como analizar las diversas alternativas actuales.
Material y método: Estudio observacional, descriptivo y retrospectivo donde consideramos edad, sexo, lateralidad, tiempos de intervención, afectación en RNM, número de anclajes empleados y resultados de movilidad final en las escalas de Constant y de la Universidad de California Los Ángeles (UCLA).
Resultados: Se observó a 22 pacientes, con una edad media de 51,7 ± 4,6 años, en los que utilizamos una media de 2 anclajes. De ellos, 13 pacientes fueron tratados con parches de submucosa intestinal porcina, 6 con pericardio equino y 3 con dermis porcina. Los resultados finales fueron de 37,6 ± 13 puntos para el test de Constant frente a los 16,9 ± 3,9 puntos para el test UCLA. Seguimiento de 36 ± 10,2 meses.
Conclusiones: En nuestra experiencia, los xenoinjertos proporcionan unos resultados funcionales aceptables para manguitos cuya sutura haya resultado ineficaz y son una alternativa a las transferencias tendinosas en casos de roturas masivas. Se precisan más estudios con otros tipos de biomateriales.

Introduction and objectives

One of the most common complications of rotator cuff surgery is suture rupture, which, according to Schlegel[1] occurs in between 38% and 65% of cases. The 300 N generated by the supraspinatus in abduction between 0° and 30° might put the suture itself under tension and trigger its failure. According to Derwin,[2] the hypovascular nature of the tendon, the degree of rupture, the degree of muscular atrophy, the tendon quality and the postsurgical rehabilitation protocol contribute to this failure. We consider that there is a multifactorial basis for suture failure; essentially a mechanical substrate (influenced by the degree of retraction of the rupture, and starting intensive rehabilitation very early) and a biological substrate (in which the degree of fat atrophy, or the poor vascularisation in the insertional area might contribute towards suture failure). Denard[3] described a series of intrinsic causes (such as age, size of tear, number of tendons affected, fatty degeneration, etc.) and extrinsic causes (level of surgical skill, type of suture, anchors or postsurgical rehabilitation protocol), which might influence re-rupture after a previous suture attempt. The patient's type of occupation[4] might also affect these injuries.

Currently, biological meshes are a mechanical alternative to relieve suture tension and provide biological support for regeneration of the tendon. In this sense, porcine intestinal submucosa, with 90% collagen, glycosaminoglycans, fibronectin and growth factors, such as the fibroblast (FGF 2), beta transforming (TGF-β) and vasculoendothelial (VEGF) growth factors would be an alternative worth considering. Others, such as equine pericardium or porcine dermis, were used in this study. Placement of this biological support forms ''biological scaffolding'' on which the damaged rotator cuff can repair itself, particularly useful in cases of degenerated tendon with little capacity for repair, and as interposition material in cases of massive retracted tears.[5] These meshes incorporate growth factors, which have been reported as useful in the rotator cuff,[6,7] although there are authors[8–10] who doubt their benefit. One of the initial descriptions of the use of a biological support mesh in rotator cuff surgery is by Dejardin,[11] who published an article in 2001 where he replaced the infraspinatus in dogs with porcine intestinal submucosa, and observed a similar strength to that of the original infraspinatus at 3 and 6 months.

Our objective was to analyse 22 cases of rotator cuff re-rupture treated with resuture and orthobiological reinforcement with porcine intestinal submucosa mesh, equine pericardium and porcine dermis.

Material and methods

A series of clinical cases comprising 22 patients operated in our centre in the past 4 years implanted with reinforcement meshes for rotator cuff repair. Follow-up was from 36 ± 10.2 months.

This study covers patients with tendon re-rupture, after a prior attempt at rotator cuff repair.

The materials used were: in 13 cases, Restore (De Puy-Mitek®) from porcine intestinal submucosa; in 6 cases, OrthoAdapt (Pegasus Biologics®) from equine pericardium;