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ORIGINAL ARTICLE

Closure of Recurrent Cleft Palate Fistulas With Plasma Rich in Growth Factors☆

Jorge Glicerio González-Sánchez, Karina Jiménez-Barragán*

Servicio de Otorrinolaringología y Cirugía de Cabeza y Cuello, Hospital Dr. Valentín Gómez Farías, ISSSTE, Zapopan, Jalisco, Mexico

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KEYWORDS
Cleft palate;
Fistula;
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Abstract
Introduction and objective: Fistulas represent a significant challenge in the treatment of cleft palate. The best outcome of a palatoplasty is obtained with a competent velopharyngeal sphincter and a palate without fistulas. The recurrence of primary cleft palate fistula is reported as high as up to 76%, and to nearly 100% in recurrent fistulas.

Plasma rich in growth factors (PRGF) is an autologous blood product with biologically active substances that enhance tissue repair mechanisms such as chemotaxis, cell proliferation, angiogenesis, osteogenesis and remodeling. Its use in cleft palate fistulas has not been reported.

Our objective was to evaluate closure of recurrent cleft palate fistulas using PRGF mixed with autologous bone graft.

Methods: An experimental, prospective, longitudinal study was carried out from April 2008 to July 2010 on 11 recurrent cleft palate fistulas that were closed with local mucoperiosteal flaps and placement of autologous bone graft mixed with PRGF.

Results: Complete closure of palate fistulas was achieved in 90.9% (follow-up of 6–24 months), decreasing the reported incidence for the recurrence by other authors with other techniques.

Conclusions: The use of PRGF mixed with autologous bone graft seems to be an effective, safe and low-cost technique for the closure of recurrent cleft palate fistulas. However, we consider its study must be extended.

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* Corresponding author.
E-mail address: karinitas@hotmail.com (K. Jiménez-Barragán).

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PALABRAS CLAVE
Paladar hendido;
Fístula;
Plasma rico en plaquetas;
Factores de crecimiento

Cierre de fístulas nasopalatinas recurrentes con plasma rico en factores de crecimiento en pacientes con paladar hendido

Resumen:
Introducción y objetivo: Las fístulas palatinas representan un desafío importante en el tratamiento del paladar hendido. Los mejores resultados de una palatoplastia se obtienen con un esfínter velofaríngeo competente y un paladar sin fístulas. En la literatura se describe que la recurrencia de fístulas palatinas primarias es de hasta el 76% y las recurrentes es de aproximadamente el 100%.

El plasma rico en factores de crecimiento (PRGF) es un hemoderivado autólogo con sustancias biológicamente activas que promueven los mecanismos de reparación tisular como quimiotaxis, proliferación celular, angiogénesis, osteogénesis y remodelación. No se ha descrito su uso en reparación de fístulas nasopalatinas.

Nuestro objetivo fue evaluar el cierre exitoso de fístulas palatinas recurrentes con el uso del PRGF combinado con injerto óseo autólogo.
Pacientes y método: Se realizó un estudio experimental, prospectivo, longitudinal desde abril 2008 a julio 2010, con un total de 11 fístulas nasopalatinas, las cuales se cerraron por medio de colgajos mucoperiósticos locales y colocación de injerto óseo autólogo mezclado con PRGF.
Resultados: Con un seguimiento de 6–24 meses, se demostró el cierre completo de las fístulas en el 90,9%, disminuyendo el índice de recurrencia descrito con otras técnicas por otros autores.
Conclusión: El uso de PRGF mezclado con injerto óseo autólogo parece ser una alternativa eficaz, segura y de bajo costo para el cierre de fístulas palatinas, sin embargo su estudio debe ser ampliado.

Introduction

Palatal fistulas are a major problem in the treatment of patients with cleft palate. The formation of fistulas after primary palatoplasty has been variably described, since the classification systems for fistulas differ. Cohen et al.[1] described a 23% incidence of palatal fistula formation after primary palatoplasty. Emory et al.[2] carried out a literature review, which found the presence of up to 36% of palatal fistulas. Smith et al.[3] described an incidence between 0% and 76% of palatal fistula after primary palatoplasty. Recurrence after repair of a palatal fistula is even higher, with reports that range from 25% to 33%[1,2,4] to nearly 100%.[5] The most common sites of fistulization are the hard palate and the junction of the hard and soft palates, although it can also occur in the soft palate.[3]

Cohen et al.[1] classified fistulas by their size into small (1–2 mm), medium (3–5 mm) and large (more than 5 mm).[1] By their location, the Pittsburgh classification divides them into: (1) uvular, (2) soft palate, (3) junction between hard and soft palate, (4) hard palate, (5) junction between primary and secondary palate, (6) lingual alveolar and (7) labial alveolar.[3] It has been suggested that the variables that increase the risk of palate fistula are the type of primary defect (Veau classification), the type of primary repair surgery (significantly more frequent in Wardill–Kilner type closures) and the experience of the surgeon.[1]

Palatal fistulas have traditionally been closed using local mucoperiosteal flaps. However, they recur in 1 out of every 3–4 patients. The risk of recurrent fistula increases once the closure of the primary defect has failed. The fibrosis and decreased vascularization that occur with each surgery could explain this increase in risk. Several authors have described different surgical techniques for recurrent palatal fistulas closure to decrease this recurrence, such as using lingual flaps,[6,7] buccal flaps,[8] bone grafts,[9–14] buccal musculomucosal flaps,[15] buccal fat flaps,[16] conchal cartilage,[17] acellular dermal matrix[18] and turbinal flaps[19].

Plasma rich in growth factors (PRGF) is an autologous blood product with a high platelet concentration. It is used to manage and maximise both surgical and nonsurgical wound repair. The main components of PRGF are the following types of growth factors: platelet-derived, vascular endothelial, beta-type transforming, epidermal, fibroblast and insulin-like I. These factors promote the synthesis of the extracellular matrix, stimulate the synthesis of type I collagen, fibronectin and osteonectin, deposition of extracellular matrix and chemotaxis. They also decrease the synthesis of metalloproteins and plasminogen activating factor, thereby reducing the destruction of the extracellular matrix. They inhibit osteoclast formation as well, but promote bone resorption by the mechanism of prostaglandins.[20] Cell repair and regeneration are also promoted by stimulation of mitosis and cell migration, and the synthesis of proteins such as fibronectin is also promoted.[21] They also contain chemotactic agents for endothelial vascular cells, thereby promoting wound neovascularization. A pro-angiogenic action has been observed by chemotactic action on endothelial cells.

The main uses of PRGF to date are in dental and maxillofacial surgery, to repair defects caused by dental extraction[22] or tumour resection,[23] as well as for alveoloplasty.[24] Other specialties have studied its effect in surgical procedures such as acromioplasty,[25] arthroscopy,[26] rhytidectomy with fat grafts,[27] skin wounds[28] and infiltration