BioXclude™ Placental Allograft Tissue Membrane Used in Combination with Bone Allograft for Guided Tissue Regeneration Treatment of Periodontal Intrabony Defect: A Case Report

Dan Holtzclaw, DDS, MS, Austin, TX

Background: Guided tissue regeneration (GTR) for correction of periodontal intrabony defects has been an accepted treatment modality for nearly 30 years.1 The concept of GTR involves the use of membranes to provide space maintenance, wound stability, epithelial cell exclusion, and graft containment. GTR has evolved greatly over time as a variety of different materials have been used for the process including non-resorbable expanded polytetrafluoroethylene (e-PTFE) and polytetrafluoroethylene (PTFE) as well as resorbable collagen, polylactic acid, elastic polymers, and pericardium. More recently, growth factors such as platelet rich plasma (PRP), enamel matrix derivative (EMD), platelet derived growth factor (PDGF), and bone morphogenetic proteins (BMP) have been combined with GTR to achieve improved results. BioXclude™, a resorbable amnion chorion membrane, continues the progressive development of GTR as it is the first membrane to provide growth factors and cell adhesion proteins within the membrane. This case report documents use of BioXclude™ for treatment of a periodontal intrabony defect.

Case Report: A 72 year old Caucasian male was referred for evaluation and treatment of a deep periodontal lesion on the left mandibular first molar (tooth #19) (figure 1). Clinical evaluation with a UNC-15 probe revealed a probing depth (PD) of 9mm and 10mm of clinical attachment loss (CAL). Bleeding and suppuration upon probing were noted and the site was uncomfortable to the patient. Digital radiographs suggested a deep vertical intrabony defect approximating 50% of the distal root of tooth #19 (figure 2). The patient was diagnosed with localized severe chronic periodontitis and appointed for GTR therapy.

Prior to surgery, occlusal adjustment was performed with a high speed hand piece and 7404 finishing bur under irrigation. Local anesthesia was achieved with a standard inferior alveolar block injection using 4% articaine with 1:100,000 epinephrine. A sulcular full thickness mucoperiosteal flap was elevated in the mandibular left quadrant. Upon thorough debridement of the intrabony defect at the distal of tooth #19 with hand and ultrasonic instruments, a very large piece of calculus was noted approximating one half of the defect depth. This finding is consistent with those reported by Richardson in 1990.2

Following removal of the residual calculus (figure 3), the intrabony defect was thoroughly irrigated with sterile saline and packed with mineralized freeze dried bone allograft (Community Tissue Services) (figure 4). No growth factor was added to this graft. A BioXclude membrane was carefully trimmed and placed interproximally and adapted to fully cover the grafted defect (figure 5). The mucoperiosteal flaps were then replaced with 5-0 nylon sutures using a modified vertical mattress technique. The gingival tissue was then compressed for 2 minutes with moist gauze.

Postoperatively, the patient was instructed to take Amoxicillin 500mg three times per day for a total of 10 days. Pain management was achieved with a combination of ibuprofen 800mg taken 3 times daily and tramadol 50mg taken as needed. The patient was instructed not to brush or floss the surgical site until the first postsurgical visit. 0.12% chlorhexidine gluconate was prescribed to be used as a mouth rinse twice daily for plaque control. Ten days following surgery, the patient was seen for an initial postoperative visit at which time sutures were removed. An additional visit was performed 2 weeks later. Periodontal maintenance was performed at 3 month intervals, rotating between the periodontist and general dentist offices.
Results: Healing after surgery was uneventful and the patient experienced little discomfort. At the initial 10 day postoperative visit, the surgical site exhibited excellent early soft tissue healing and minimal inflammation. At the 3 week postoperative visit, continued excellent healing was noted.

At 6 months, PD and CAL measurements were retaken with the same UNC-15 periodontal probe. At six months, PD improved by 6mm (Pre-surgical PD: 9mm; Postsurgical PD: 3mm) and CAL improved by 5mm. There was no bleeding upon probing and the site no longer caused pain or sensitivity to the patient (figure 6 & 7). Digital radiography at six months suggested significant bone fill of the intrabony defect (figure 8 & 9).

Discussion: BioXclude is a processed, dehydrated and sterilized graft of human placenta amnion and chorion tissue which has recently been employed for GTR therapy. Human placental allografts are composed of immunoprivileged tissue, possess anti-bacterial and anti-microbial properties, reduce inflammation at the wound site, and provide a protein enriched matrix to facilitate cell migration.3 This membrane differs from other membranes currently available in the fact that it has inherent anti-inflammatory and anti-bacterial properties.3,4 Additionally, this membrane also contains a high concentration of laminin-5 through out the amnion corion membrane.5 Laminin-5 is a protein with a high affinity for cellular adhesion of gingival epithelial cells6, providing a bioactive matrix for cellular migration. This allows for rapid sealing of the underlying graft material used for the treatment of intrabony defects. Furthermore, immunohistochemical stain analysis of BioXclude has also shown the membrane to contain growth factors such as platelet derived growth factors alpha and beta (PDGF-α, PDGF-β) as well as transforming growth factor beta (TGF-β).5

In addition to its unique composition advantage, BioXclude has other benefits that make it easy to use. During placement, orientation does not matter. BioXclude is relatively thin (300µm) with self-adhering properties once it becomes moist. This eliminates the need for suturing of the membrane and allows for tight adaptability to the underlying bone and tooth surface. BioXclude can be folded onto itself and or placed over exposed roots without consequence. These attributes greatly decrease the need to precisely trim BioXclude to match the contours of the intrabony defect.

This case report demonstrates proof of principle that BioXclude is an effective product for GTR treatment of periodontal intrabony defects. The unique properties of this membrane combined with its ease of use make it an ideal product for GTR procedures.