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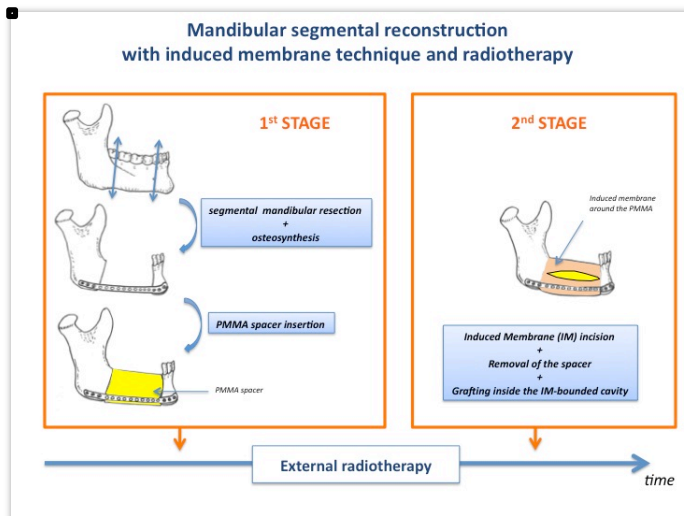
BioTis (U1026), Bordeaux University



Research Interests:

Mandibular reconstruction with induced membrane technique

Worldwide 500,000 cases of head and neck cancer are diagnosed each year and 17,000 new cases per year in France. Among them, oral cancer is the sixth most frequent cancer in the world (1), representing 6,500 cases in France. Its treatment is based mostly on a combination of surgery, radiotherapy and chemotherapy. For tumor adjacent to or infiltrating the mandible, resection of the mandible is the gold standard. This resection can be partial or segmental. After carcinologic surgery, the reconstruction of the mandible is required and different techniques have been proposed: plates, graft, flap, distraction and more recently the induced membranes.



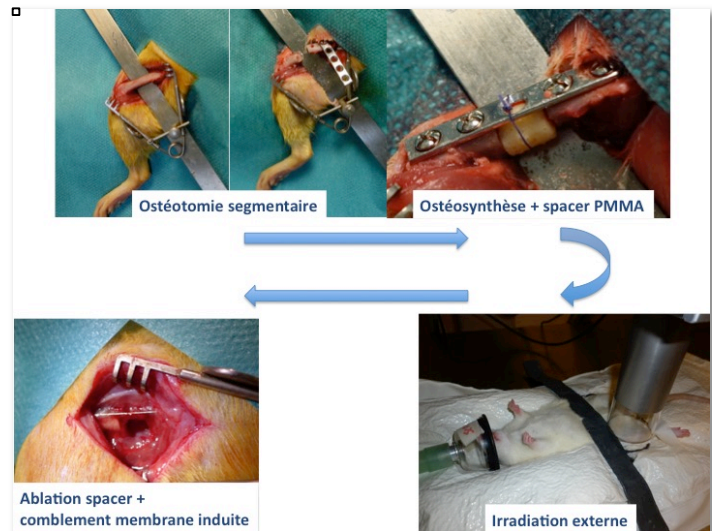
Masquelet *et al* described a procedure that combines induced membranes and cancellous autograft for the reconstruction of large segmental diaphyseal defects. The bone defect is first filled with a polymethylmethacrylate (PMMA) cement to maintain the space and induce the formation of a pseudosynovial membrane. Two months later, the PMMA is removed and the defect, surrounded by the induced membrane, is reconstructed using an autologous cancellous bone graft. The induced membrane promotes vascularization and corticalization of the graft by the production of growth factors.

The use of induced membrane as an alternative to conventional techniques of mandibular reconstruction in the specific context of cancer surgery is suitable for several reasons:

- a regenerative strategy in two stages is mandatory due to the delay imposed by the radiotherapy treatment. The spacer maintains the space corresponding to the loss of bone substance for a secondary reconstruction.
- surgery close to the lining of the oral cavity induces the risk of contamination in case of laceration of the mucosa. Induced membrane carries an additional pseudosynovial tissue to protect the graft.
- induced membrane provides neoangiogenesis necessary for bone formation, especially in a context of radiotherapy of the jaw that induces hypovascularisation.

We developed an induced membrane model in rats with bilateral femoral segmental osteotomy. This model is suitable for external radiotherapy to investigate the influence of irradiation in osteogenesis inside the induced membrane.

We are now developing a large animal model in minipig for segmental mandibular reconstruction using induced membrane technique.



Keywords/expertise:

- Tissue-engineering
- Regenerative Medicine
- Pre-clinical studies
- Translational medicine

Selected publications:

de Monès E, Schlaubitz S, Oliveira H, d'Elbée JM, Bareille R, Bourget C, Couraud L, Fricain JC. Comparative study of membranes induced by PMMA or silicone in rats, and influence of external radiotherapy. *Acta Biomater.* 2015 Jun;19:119-27. doi: 10.1016/j.actbio.2015.03.005. Epub 2015 Mar 11. PubMed PMID: 25770925.

de Monès E, Schlaubitz S, Catros S, Fricain JC. Statins and alveolar bone resorption: a narrative review of preclinical and clinical studies. *Oral Surg Oral Med Oral Pathol Oral Radiol.* 2015 Jan;119(1):65-73. doi:10.1016/j.oooo.2014.09.030. Epub 2014 Oct 5. Review. PubMed PMID: 25482549.

Zwetyenga N, Fricain JC, De Mones E, Gindraux F. [Induced membrane technique in oral & maxillofacial reconstruction]. *Rev Stomatol Chir Maxillofac*. 2012 Sep;113(4):231-8. doi: 10.1016/j.stomax.2012.05.008. Epub 2012 Jul 25. Review. French. PubMed PMID: 22840565.

Clinical Activities:

Otorhinolaryngology and Head and Neck Surgery

In the department, I am the head of the sub-unit in charge of patients with a head and neck tumor (benign or malignant) and laryngological disorders. We perform reconstruction surgery after cancer resection and minimal invasive surgery through a trans-oral approach.

Funding:

- Fondation des Gueules Cassées (2011): <http://www.gueules-cassees.asso.fr> (FGC 27-2011)
- Fondation de l'Avenir (2012-2013): <http://www.fondationdelavenir.org> (ET1-632 and ET2-666)
- Fondation pour la Recherche Médicale (2013): <https://www.frm.org>

Memberships:

- Société Française d'Otorhinolaryngologie et Chirurgie Cervico-Faciale: <http://www.sforl.org>
- Collège des Enseignants en ORL: <http://campus.cerimes.fr/orl/>
- Groupe d'Etude des Tumeurs de la Tête et du Cou (GETTEC): <http://gettec.org>

Education:

2011-2015	Ph.D. in "Science, Technology, Health" Université de Bordeaux, Bordeaux, France	Laboratoire BioTis (U1026)
2001-2006	Medical Fellowship	Hôpital Européen Georges Pompidou, Université Paris V, Paris, France Institut de Cancérologie Gustave Roussy, Université Paris Sud, Villejuif, France
1997-1998	M.Sc. in Phonetic	Université Paris III, Paris, France Laboratoire d'Angiogenèse Expérimentale / LOEX
1993-2001	Medical Residency	Université Claude Bernard, Lyon, France INSERM U209 (Pr. J. Thivolet)
1987-93	Medical Studies	UFR Kremlin Bicêtre, Université Paris Sud, France

Links:

Bordeaux University Hospital (CHU de Bordeaux): <https://www.chu-bordeaux.fr/Les-unites-medicales/Unité-de-chirurgie-cervicale-et-cancérologie-ORL/>

Bordeaux ENT school (Ecole Universitaire ORL de Bordeaux):
<http://www.orlbordeaux.fr/fr/unite/chir-cervicales.html>

ReaserchGate: https://www.researchgate.net/profile/Erwan_De_Mones

BxCR: Bordeaux Consortium for Tissue Engineering: <https://bcm.u-bordeaux.fr>

BIOMAT : The French association for the development of biomaterials, Tissue Engineering and Regenerative Medicine: <http://www.biomat.fr>