

Surgical Use Of Placentrex Gel As A Wound Healing Agent: A Case Report

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Abstract

An inflammatory reaction to plaque on tooth surfaces or as a result of drugs and various systemic disorders is gingival enlargement. Gingivectomy/gingivoplasty is used when local variables are at play and subgingival scaling and root planning are ineffective. This procedure leaves a raw wound that heals slowly. Because surgical practice primarily depends on these wounds healing without major complications or infections, placental extract gel has been used as a therapeutic agent to speed up the healing process after surgery because of its special pharmacological effects, which include enhanced wound-healing, anti-inflammatory, analgesic effect, and more. A variety of substances with biological and therapeutic activity present in human placenta have been isolated and identified as hormones, proteins, glycosaminoglycans, nucleic acids, polydeoxyribonucleotides (PDRNs) etc which therefore plays a major role in the faster healing of a surgical wound.

Keywords: Placenta, Healing, Gingivectomy, Gingivoplasty

Introduction

Hyperplasia, or gingival enlargement, is a disease that frequently results from drug consumption throughout the body, plaque buildup on the tooth surface, and other systemic factors. If the enlargement is due to local factors, then removal of the same by subgingival scaling will cause the regression of the enlargement. However, occasionally the growth persists despite multiple scaling and root planing procedures. In these cases, gingivectomy/gingivoplasty leaves a raw wound that heals more slowly from secondary intention. The gingiva must be surgically removed. The process of epithelization takes six weeks to finish. Patients go through a lot of pain and discomfort throughout this time.¹

The primary goal of surgery is to cure wounds without experiencing major complications or infections. It is responsible for a significant amount of patient discomfort, morbidity, and prolonged hospitalizations. Therefore, better healing depends on postoperative care, which has been achieved through the years using a variety of techniques.

Many people now believe that the placenta has the potential to completely revolutionise modern medicine. It promotes immune system, hormonal, and neurological system modulation, which in turn improves tensile strength of the healing tissue and enhances collagen formation. It also provides resistance to the body.^{3,4}

Use of placenta as a therapeutic agent has been prevalent for a long time because it is an immunologically privileged organ and has unique pharmacological effects like enhancement of wound-healing, anti-inflammatory action, analgesic effect etc. A variety of substances with biological and therapeutic activity present in human placenta, have been isolated and identified as hormones, proteins, glycosaminoglycans, nucleic acids, polydeoxyribonucleotides (PDRNs) etc.³

The composition of placental extract thus depends on the method of its preparation. In many countries, intramuscular and topical use of the extract for burn injuries, chronic wounds and as postsurgical dressing is an age old practice.³

Growth factors of the placenta include:

1. Hepatocyte Growth Factor (HGF): Promotes growth of liver parenchymal cells and various tissues.
2. Nerve Growth Factor (NGF): Promotes growth of nerve cells (sensory and sympathetic ganglionic cells).
3. Epidermal Growth Factor (EGF): Promotes growth of skin, lungs, cornea, and tracheal epithelial cells.
4. Fibroblast Growth Factor (FGF): Promotes growth of human fibroblasts, glia cells, and vascular endothelial cells.
5. Insulin-like Growth Factor (IGF): Promotes growth of cartilage cells, and smooth muscle cells.
6. Colony-Stimulating Factor (CSF): Promotes growth of stem cells such as immunocompetent cell granulocytes, and macrophages.
7. Interleukin-1 (IL-1): Promotes production of immune-competent cells (T-cells, B-cells, and NK-cells), Thymus cells and lymphokines.
8. Interleukin-2 (IL-2): Promotes growth of Tcells (helper T-cells, killer T-cells, and suppressor T-cells).
9. Interleukin-3 (IL-3): Promotes growth of hematopoietic cells, and mast cells.
10. Interleukin-4 (IL-4): Promotes growth of B cells, and promotes division of antibody producing cells.

Other therapeutic effects of placenta are:

- Gynaecology: menopausal disorders, menstrual pain, irregular menstruation, failure of lactation, and high prolactin levels, etc.
- Internal Medicine: hepatitis, cirrhosis of the liver, chronic pancreatitis, diabetes, chronic gastritis, dyspepsia, gastric ulcers, duodenal ulcer, ulcerative colitis, bronchial asthma, chronic bronchitis, high blood pressure, low blood pressure, habitual constipation, and collagen disease,
- Surgery: chronic rheumatoid arthritis, osteoarthritis, arthritis, neuralgia, lumbago, and stiff shoulders, etc.
- Dermatology: atopic skin complaints, psoriasis, body odour, eczema, chapped skin, spots, and freckles, etc.
- Psychiatry: autonomic ataxia, and sleeplessness, etc.
- Urology: enlarged prostate, cystitis, and haemorrhoids, etc.
- Ophthalmology: cataracts, allergic conjunctivitis, and vision loss, etc.
- Ear, Nose and Throat: allergic rhinitis, Meniere's disease, and hay fever, etc.
- Dentistry: Periodontitis, and gingival disease, etc.

Case Report

A 19-year-old female patient reported to the OPD with the chief complaint of enlarged gums in the lower front teeth region since 6 months. The history of the present enlargement showed that the growth was minor at first and grew steadily over the course of six months to reach its present size. Often, enlargement was linked to bleeding when brushing with no medical or dental history.

Clinically, the gingival enlargement was visible as a deep red or bluish-red color, with a glossy surface that bled readily when provoked, and a slight ballooning of the marginal gingiva and interdental papilla. The patient had poor dental hygiene and many local factors, including calculus and plaque, were present.

The patient received a thorough explanation of the treatment strategy and a plan for the electrosurgery-assisted surgical removal of the gingival growth two weeks after Phase I therapy concluded. Gingivoplasty was carried out using electrosurgery from the distal aspect of the mandibular right canine to the distal aspect of the mandibular left canine, following the patient's consent and the necessary hematologic investigations.

The patient had been prophylactically prescribed antibiotic, Saginox CV 625mg, from the day before surgery along with Gutcade and Penroc DSR. From the day of surgery for next 5 days, anti-inflammatory (Flozen Plus) was also added and Placentrex gel was prescribed for application over the surgical wound area, so as to improve the rate of healing. Additionally, the patient was also prescribed 0.2% chlorhexidine mouthwash.

Patient was followed-up at 1-week, 1-month and 3-month intervals. No evidence of recurrence was reported until the last follow-up. One week after the treatment, a superficial thin layer of denatured collagen was present, and at 1-month follow-up, the wound was uneventfully completely healed.



PRE-OPERATIVE VIEW



1 Week before surgery localized SRP done wrt 33 to 43



IMMEDIATE POST-OPERATIVE



PLACENTREX GEL



1 WEEK POST-OPERATIVE



1 MONTH POST-OPERATIVE



3 MONTHS POST-OPERATIVE

Discussion

The human placenta has been characterized as an organ with special immune properties. Russian ophthalmologist Filatov was the first to study the medicinal potential of placental extract, characterizing it as a biogenic stimulant that may aid in the healing of damaged tissues.^{5, 6} Placental extract has anti-inflammatory, analgesic, and wound-healing effects. The placenta has been shown to contain a variety of biological products, including proteins, hormones, polydeoxyribonucleotides, nucleic acids, glycosaminoglycans, and glycoproteins, which may have therapeutic use as a wound-healing agent.⁵

Aqueous extract and hydroalcoholic extract are the two categories into which placental extracts fall. The components that are present in the extract are determined by the extraction solvent's solubility and the method used to prepare it. Because proteins are very soluble in aqueous medium, an aqueous extract is therefore likely to contain more polar molecules like peptides/proteins, small organic components including amino acids, nucleotides, polydeoxyribonucleotides (PDRNs), carbohydrates, and trace amounts of lipids. Similarly, hydroalcoholic extract may contain different kinds of lipids (less polar and hydrophobic). Chemical analysis of the hydroalcoholic extract revealed the presence of glycosphingolipids, cholesterol, triglycerides, high density lipoproteins, carbohydrates, sialic acids and others, including amino acids, nucleotides, carotenes, vitamins, including small amount of low-molecular-weight proteins/peptides containing hydrophobic amino acid residues which are soluble in a less polar solvent.⁷

Compared to Povidone Iodine and saline dressing, Placentrex gel speeds up healing without interfering with granulation tissue. It has been discovered to work even in the presence of blood, slough, and pus serum.² According to Subramaniam⁸, Placentrex Gel dressing appears to clear the lesion of infection in indolent ulcers, which subsequently results in sufficient granulation tissue production and promotes healing.

Povidone iodine ointment and Placentrex Gel were contrasted by Pote⁹ as topical treatments for superficial burns. Researchers discovered that lesions treated with Placentrex Gel healed noticeably faster than those treated with povidone-iodine ointment. It was discovered that Placentrex Gel was more acceptable than povidone iodine ointment.

Shukla¹⁰ discovered that in 4–8 weeks, 52% of patients' wounds achieved 75–100% epithelization while wearing Placentrex Gel, with no negative side effects. He discovered that because it promotes tissue regeneration and recovery and improves blood flow to injured areas, it is incredibly effective at healing wounds.

Another study was done to evaluate the healing efficacy of topically applied placental extract gel both clinically and histologically. It was concluded that local administration of HPE directly onto wound margins promotes wound healing due to an increase in the amount of transforming growth factor in the early phase of wound healing and vascular endothelial growth factor in the late phase.¹¹ After depigmentation, it has been observed that the application of Placentrex gel helped in healing the wound better with better patient comfort when compared to a periodontal dressing alone.¹²

The placental extract is similar to human fibronectin type III glycoprotein, which helps repair wounds and is in charge of maintaining normal cell morphology, cell migration and homeostasis. The extract's well-known angiogenic mediator qualities encourage neovascularization, which enhances wound healing.¹³⁻¹⁵

After conducting an *in vitro* study on the growth inhibition of microorganisms by human placental extract, Chakraborty and Bhattacharyya¹⁶ determined that the extract also possesses fungistatic and bacteriostatic capabilities. Even the application of placental extract in the treatment of necrotizing fasciitis and the healing of infected wounds has been established by Pandey et al¹⁷. In an investigation done by Thakur et al¹⁸ investigation, topical placental extract gel administration on fibrotomy wounds demonstrated improved wound healing after surgery.

Conclusion

Placenta is an important drug with therapeutic applications in dentistry, and its significance in wound healing has grown dramatically as a result of the discovery of physiologically active components in placental extracts. Nevertheless, further clinical evidence is needed before it may be widely applied in periodontology.

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Conflict of interest

None

References

1. **Reddy SP, Koduganti RR, Panthula VR, Surya Prasanna J, Gireddy H, Dasari R et al.** Efficacy of Low-level Laser Therapy, Hyaluronic Acid Gel, and Herbal as Adjunctive Tools in Gingivectomy Wound Healing: A Randomized Comparative Clinical and Histological Study. *Cureus*. 2019;11:1-14.
2. **Patel HD.** A comparative study of Placentex gel versus povidone iodine in non-healing wound. *MedPulse International Journal of Surgery*. 2020;13:121-126.
3. **Nishan M.** Role of Placentex in Dentistry and Oral and Maxillofacial Surgery: A Review. *Saudi J Oral Dent Res*. 2020;5:481-484
4. **Kondaveeti SS, Divyambika CV, John C, Manickavasagam M, Rajendiran S.** Therapeutic Benefit of Placentex in the Management of Acute Chemo Radiation Induced Mucositis in Oral Cancer Patients. *Asian Pac J Cancer Prev*. 2018;19:3099–3103.
5. **Vineeta, Aditya, Jithendra.** Placental extract -the magical wound healer, Next milestone in the healing of periodontal surgery. *IOSR J Dent Med Sci (IOSR-JDMS)*. 2016;15:73-79.
6. **Filatov, V.P.** Tissue Therapy. *Foreign Language Publishing House*.1955.
7. **Chakraborty PD and Bhattacharyya D,** Aqueous Extract of Human Placenta as a Therapeutic Agent. *Recent Advances in Research on the Human Placenta* 2012;6:77-92.
8. **Subramanian T, Vijayarathinam P, Sathyavan V, Navaneethkrishnan S, Anugraham S, Anbalagan K et al.** Effects of placental dressing indolent ulcers. *J Indian Med Assoc*. 1990;88:314-316.
9. **Pote MP.** Comparative evaluation of povidone-iodine ointment and human placental extract as topical agent for treatment in superficial burn. *Ind Med Gaz Develop Mod Med Surg*. 2004;7:351-354.
10. **Shukla VK, Adil M.** Placental extract in wound healing. *Innovations in wound care*. 2001;10:4-7.
11. **Gupta V, Sinha A, Jithendra KD, Chauhan SS, Singh S.** Placenta extract - the magical wound healer, next milestone in the healing of periodontal surgery. *IOSR-JDMS*. 2016;15:73–79.
12. **Katkurwar A, Chaudhari D, Mahale S, Mahale A, Kadam P.** Human placental extract a miracle that heals the wound faster. *J Oral Res Rev*. 2021;13:1–5.
13. **Vaidya S, Sharma VK:** Oral submucous fibrosis. *World Articles Ear Nose Throat* 2; 2009. Available at: www.waent.org/archives/2009/vol2-1/submucosal-fibrosis/submucous-fibrosis.htm. Accessed. Q4
14. **Cianfarani F, Zambruno G, Brogelli L et al:** Placenta growth in diabetic wound healing: Altered expression and therapeutic potential. *Am J Pathol* 169:1167, 2006
15. **Raj RT, Kaur B, Lochan KK, Bahl RK:** Nimesulide induced Steven Johnson syndrome (SJS): Managed successfully with combined approach of steroids, intravenous immunoglobulins and placentex gel: A case report. *Our Dermatol Online* 5:384, 2014
16. **Chakraborty PD, Bhattacharyya D:** In vitro growth inhibition of microbes by human placental extract. *Curr Sci* 88:872, 2005
17. **Pandey A, Gangopadhyay AN, Sharma SP et al:** Surgical considerations in pediatric necrotizing fasciitis. *J Indian Assoc Pediatr Surg* 14:19, 2009
18. **Thakur G, Thomas S, Bhargava D, Pandey A.** Does topical application of placental extract gel on postoperative fibrotomy wound improve mouth opening and wound healing in patients with oral submucous fibrosis?. *Journal of Oral and Maxillofacial Surgery*. 2015 Jul 1;73(7):1439-e1.