



壁報論文比賽作品 醫院組佳作

⊕ Treatment of Labially Impacted Maxillary Incisors with Dilacerated Roots by Force Eruption and Apically Positioned Flap: 2-year Follow-up ⊕

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Introduction

The most commonly impacted tooth is the maxillary canine, followed by the maxillary central incisor. Impacted central incisors are usually impacted labially. The apically positioned flap (APF) technique is commonly employed for uncovering the labially impacted teeth.

The report presented three female cases with a mean age of 8.7 years old. The delay in eruption of maxillary central incisor was diagnosed as impacted maxillary central incisors with dilacerated roots. The treatment plane was to preserve the impacted teeth and move it into the arch via the APF procedure followed by force eruption.

The impacted maxillary central incisor was moved into a favorable position in the arch after applying a light continuous force for 8 months to 1 year. Neither buccal root fenestration nor pulp pathology was noticed around the teeth.

Case 1 Pretreatment





APF Exposure



Force Eruption: two weeks after surgery



Finish



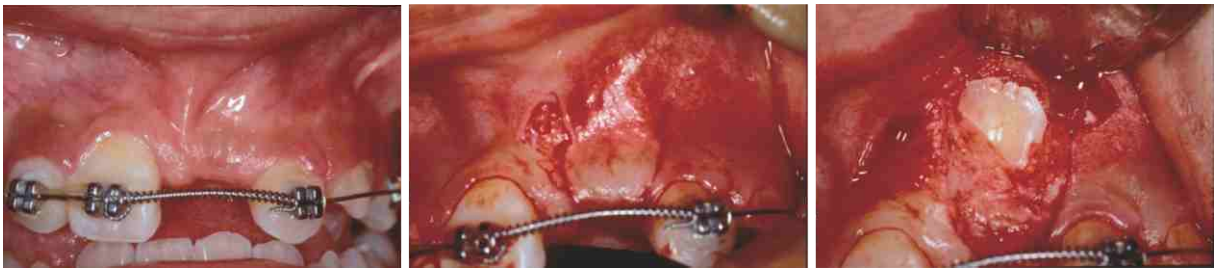
2-year follow-up



Case 2 Pretreatment



APF Exposure



Force eruption: two weeks after surgery



Finish



2-year follow-up

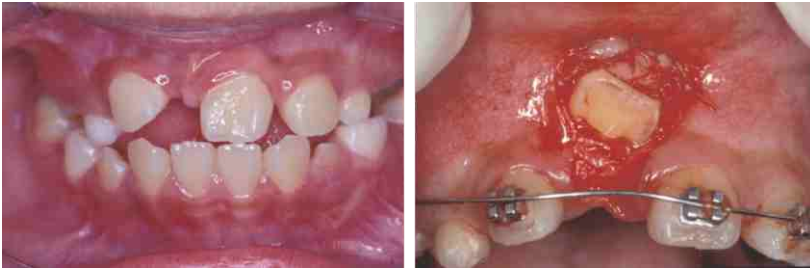


Case 3 Pretreatment



學術專題

APF Exposure



Force eruption: two weeks after surgery



Finish



2-year follow-up



Discussion and Conclusions

The APF procedure is often recommended if the tooth requires more attached gingiva or is displaced labially to the middle of the alveous. However, the negative esthetic effects include recession of gingival margin, increased clinical crown length, gingival scarring and uneven gingival margin comparing with the neighboring teeth. Even two years after the APF procedure, the unesthetic appearance of gingiva still existed in the presented cases. Therefore, another esthetic periodontal surgery may be needed especially for patients with high smiling lip line. If teeth are highly impacted and locate in the mid-alveolar area, the closed eruption technique is more appropriate.

下顎第三大白齒根管治療致下齒槽神經感覺異常 —病例報告

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摘要

下齒槽神經傷害是牙科治療少見但易引起醫療糾紛的併發症，除了大型齒顎手術外，第三大白齒拔除、植牙手術、局部麻藥注射與根管治療皆是易造成下顎齒槽神經傷害的牙科治療。本報告即是描述一根管治療後疑因沖洗液從第三大白齒根尖滲入下顎管所致神經感覺異常之病例，並透過文獻回顧探討根管治療過程中可能引發醫誤性下顎齒槽神經損傷的材料與步驟。

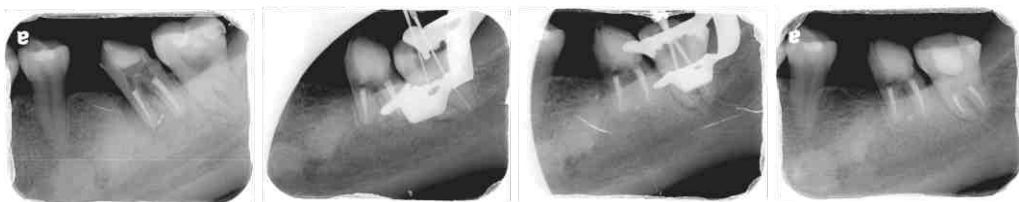
關鍵詞：神經損傷、根管治療

前言

以解剖構造而言，三叉神經的上顎分支分成支配上顎牙齒的分支與眶下神經(infraorbital n.)_{1,2}，造成上顎神經傷害主要可能的原因為創傷、正顎手術或其它大型齒顎手術₂；下顎分支分成舌神經、下顎齒槽神經與長頰神經(long buccal n.)₁，一般牙科治療可能造成的神經傷害主要為下顎齒槽神經與舌神經傷害₂，其中根管治療最可能影響為下顎齒槽神經₂。神經傷害引起的感覺異常臨床上症狀可能為燒灼感、刺痛感或局部麻木_{3,9}，以下即是一根管治療所致下顎齒槽神經感覺異常之病例報告。

病例報告

一名35歲女性，無系統性疾病與特殊用藥病史，因左下顎第三大白齒疼痛多日至住家附近牙科診所就診，診所醫師診斷為急性齒髓炎進行根管治療，根管開擴與清創數次後，疼痛仍未改善，但病患於接受根管治療後當日晚間顏面部開始感覺異常，轉診至區域醫院。經檢查病患顏面感覺異常區域包含下唇左側與左下臉頰局部，口內檢查發現左下第三大白齒牙周囊袋深度正常，敲診該齒感覺異常，周圍牙齒在各項檢查均正常，X光檢查顯示#38患齒內無封填物，根尖部位緊鄰下顎管(mandibular canal)上緣。經根管治療醫師依病患主訴與病程推測，疑是多次開擴與清創造成根尖狹窄(apical constriction)過度擴大，導致沖洗液逐漸滲出根尖。又在暫時填補前，沖洗液未完全吸乾，與病患溝通後，建議繼續完成根管治療定期追蹤，病患於根管治療完成後一個月回診，表示神經異常感覺已恢復。(圖一)



(圖一)



討論

根管治療導致神經感覺異常通常包含二大因素，一為解剖構造之相鄰接近程度⁴，二為人為操作失當。非手術性根管治療步驟與所用之材料眾多，依文獻回顧，可能造成神經傷害之步驟與材料包括：麻藥注射，根管清創、沖洗(irrigation)，根管內用藥，封填等等。以下分別探討之：

- 1.麻藥注射：注射麻藥時若針直接刺中神經鞘(sheath)，患者可能會有瞬間如電擊般疼痛的現象⁵，造成神經傷害而導致感覺異常。
- 2.根管清創：清創時若挫針超出根尖外，可能直接造成神經傷害，也會造成根尖狹窄過度擴大，導致根管製備時所產生的切削碎屑(debris)、其它感染性物質、沖洗液(irrigant)、封填材料及根管封劑(endodontic sealer)等更易滲出根尖外⁵。
- 3.沖洗：沖洗液若沖出根尖而導致神經損傷即可能產生感覺異常，次氯酸鈉具有溶解根管系統內的有機軟組織及抗微生物的能力，因此常用來作為根管治療的沖洗液，然而若其接觸到除了牙齒結構外的組織，可能會導致組織發炎，併發症可能從輕微不適、嚴重組織壞死至神經損傷⁶。
- 4.根管內用藥：氫氧化鈣為常用之根管內抗微生物製劑，在正常體溫下具有相當低的溶解度，可在組織中存留，有文獻指出氫氧化鈣若接觸到神經，少於一小時的時間即可導致不可逆的神經傷害^{7,8}，其原因可能為神經細胞膜的穩定性受到鈣離子及氫氧離子影響造成。因此，若氫氧化鈣滲出根尖至下顎管即可能產生神經損傷。

封填：馬來膠為目前普遍使用的根管封填材料，若封填時超出根尖外可能造成慢性發炎。市面上封填用糊劑其成份不一，若含丁香油酚(eugenol)則具有毒性可抑制神經活性^{5,8}；若含氫氧化鈣，滲入神經管則可能影響神經細胞膜的穩定性。此外，加熱馬來膠時可使根管內溫度達攝氏50°C至100°C，可導致骨頭損傷壞死及神經損傷⁵。

本報告之病例，因其經歷多次根管開擴與清創，若未注意工作長度與維持根尖緊縮，則易造成挫針直接傷害神經或沖洗液等材料滲出，根據病患麻木時間為根管治療後數小時才發生，判斷應非挫針直接傷害，懷疑沖洗液逐漸滲出根尖所致。

一般而言，對神經纖維的機械或化學性的刺激時間愈久其傷害愈大，有愈高的機會造成永久性的神經感覺異常。因此，一旦發生感覺異常，應儘快釐清造成神經傷害的原因，並予以適當的處置。若為非持續性的刺激，如麻藥注射、根管挫針超出根尖外等因素所致，通常可在數天至數個禮拜改善⁵；然而若為持續性的刺激因素，如根管內用藥、糊劑等超出根尖，則需考慮於48小時內進行外科清創手術⁹，移除神經管中的刺激物質。

結 論

非手術性根管治療的步驟，包括根管清創、沖洗、根管內用藥及封填等都有可能造成化學或機械性的神經傷害，導致神經感覺異常。術前小心地診斷，藉助高品質的放射影像檢查，判斷牙根尖與神經管的三度空間相對關係，正確的根管製備、沖洗及封填，可盡量避免此類併發症。若造成神經傷害導致感覺異常，應儘速做出正確診斷，並即時補救，以避免造成永久性的神經感覺異常。

參 考 文 獻

1. Michele Giuliani, Caterina Silveri. Inferior alveolar nerve paresthesia caused by endodontic pathosis : A case report and review of the literature. *Oral Surg Oral Med Oral Pathol* 2001;6: 670-4
2. M.A. Pogrel. *Current Therapy in Oral and Maxillofacial Surgery*. Ch.33. Nerve Damage in Dentistry.
3. Françoise Tilotta-Yasukaw, Sarah Millot, , Aziz El Haddioui ,Bravetti ,and Jean-François Gaudy, Montrouge, Labiomandibulr paresthesia caused by endodontic treatment: an anatomic and clinicala study. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod* 2006;102:e47-e59
4. Tyler Kovisto, BS, Mansur Ahmad , Walter R. Bowles. Proximity of the Mandibular Canal to the Tooth Apex. Division of Endodontics, University of Minnesota School of Dentistry, Minneapolis, Minnesota; and Division of Oral Medicine and Diagnosis, University of Minnesota Schoo
5. Mohammadi Z: Endodontics-related paresthesia of the mental and inferior alveolar nerves: An updated review. *J Can Dent Assoc*76:a117, 2010
6. Chaudhry H, Wildan TM, Popat S, et al. Endodontics – Sodium hypochlorite. Issue 5, 2011,239-241
7. Fredrik K.E.K., Ahlgren, Anne Christine Johannessen, Sølve Hellem, Bergen, Norway. Displaced calcium hydroxide paste causing inferior alveolar nerve paresthesia : Report of a case. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod* 2003;96:734-37.
8. Rafael Poveda, José Vicente Bagán, José Maria Diaz Fernández , and José Maria Sanchis, Mental nerve paresthesia associated with endodontic paste within the mandibular canal: report of a case. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod* 2006;102:e46-e49
9. Maria Ahonen, Leo Tj€aderhane, Endodontic-related Paresthesia: A Case Report and Literature Review. *JOE*, 2011, 1460-64



壁報論文比賽作品 診所組佳作



Research of biocompatibility on the innovative medical-grade bioceramics



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Abstract

Zirconium oxide ceramics have been developed as excellent biomaterials because of their good mechanical properties and cell growth characteristics. The present study is to investigate the cell lines on novel silver-incorporated zirconium oxide surfaces. The cell proliferation activity and morphology were evaluated by means of MTT assay, Alkaline Phosphatase (ALP) and scanning electron microscopy (SEM). From the MTT assay, time-dependent proliferation has showed that none cytotoxic effect on the zirconium/silver composite ceramics. As compared with the SEM results, it also indicated that cells attached on the common zirconium oxide and the novel zirconium/silver composite ceramics had the similar situation and morphology. These features demonstrated that the novel zirconium/silver composite ceramics possesses the good biological activity which can be applied in biomedical and dental.

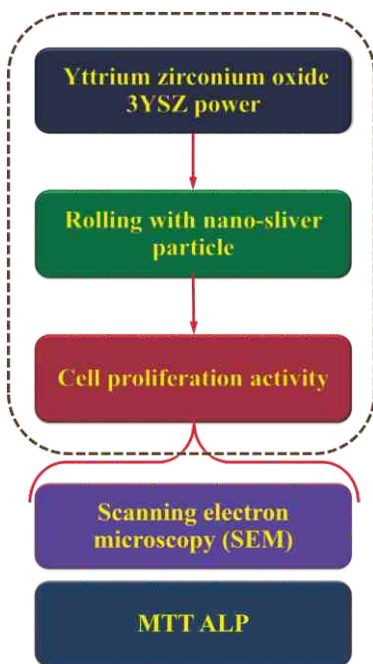
Introduction

Zirconia (Zirconium oxide) have gradually to the attention in the biomaterials application. It has a different crystalline phase at different temperatures. The phase transformation toughening mechanism is contribute to enhance the mechanical properties, such as toughness, hardness, strength and corrosion resistance. Its physical and chemical properties are similar to metals, even remarkable than it on the aesthetics. Recent research even has predicted that the zirconia materials will gradual replace by other materials at need to bear powerful force in biomedical applications.

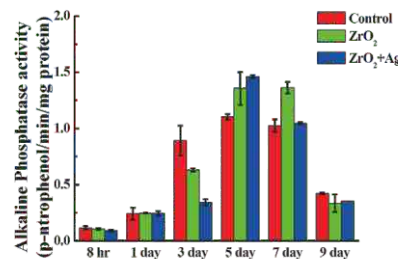
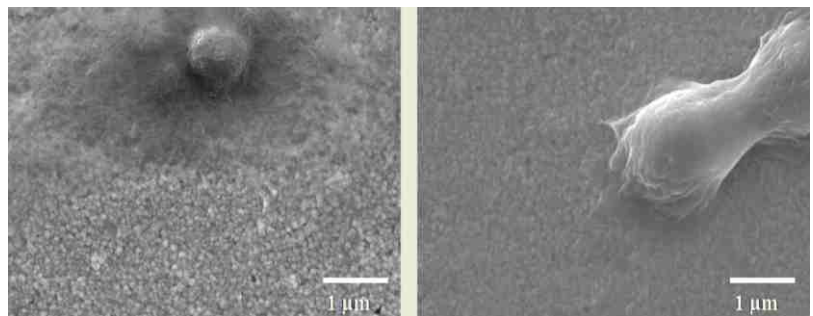
The new bio-inert ceramic zirconia was used to clinical medicine since 1988. Through adding some yttria to form partially stabilized zirconia (Y-PSZ) can as the thermal barrier insulation, the structure of its low thermal conductivity and thermal expansion coefficient compared with the metal substrate has similar advantages. The medical-grade bioceramics will be direct contact with body fluid in vivo, even longer period of time. Therefore, the biocompatibility is the most important concept to biomaterial aspect. Zirconia is very stable and almost not releases ions or tissue reaction. Excluded the metallic biomaterials affect by amino acid and protein in the body fluid, leading to metal ion liberation and corrosive situation. If have a response after implanted, the biomaterial surface would be form a thin fibrous membrane. The membrane is considered to be the ideal response for tissue and implanted, that consist of lymphocytes, fibroblasts and collagen fibers was parceled. The change over time without infiltration of inflammatory cells, the fibrous membrane will be thinner and denser. It can be used as an indicator of good biocompatibility.

In order to improve the bioceramics compatibility in vivo, it can be processed the materials surface, through the modified to increase the contact area with the organization and form a mechanical connection to enhance adhesion. In promoting cell growth process, the pore structure plays an important role. When the pore size of more than 100 μm , the cells and vascular tissue will be reconstruct. The structure of biomaterials is related with cell growth. However, the porosity is usually caused by lower intensity, so that it must avoid to the load bearing environment. On the other hand, the biomaterial has distinct chemical and surface energy properties; there may also be differences in bacterial adhesion. In order to avoid implants in the organism caused by the secondary, via applied nanotechnology to combine zirconium oxide with nano-silver particle to achieved. Research has confirmed nano-silver particles have a very broad range of antimicrobial activity and kill both Gram-negative and Gram-positive bacteria, including Escherichia coli, Staphylococcus aureus, and Streptococcus mutans. Meanwhile, in the medical-grade bioceramics is still required for cell growth. Fibroblast is to maintain the structural integrity of connective tissues in the healing period. Different organs of the fibroblast cells show different gene expression. Osteoblasts common in growing bone tissue, mostly gathered in the newly formed bone surface. The cell proliferation activity and morphology were evaluated by means of MTT assay, Alkaline Phosphatase (ALP) and scanning electron microscopy (SEM).

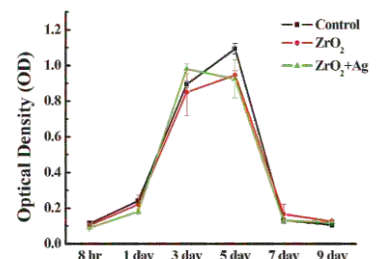
Experiment Procedure



Results



The bone metabolism of ALP assay(MG-63).



Determine to the cell survival or proliferation dependent on different time.

Conclusions

Zirconia ceramics used in oral restoration of prosthesis has shown favorable biocompatibility, chemical stability, and color property. Several studies demonstrated that add nano-silver with zirconia could decrease the susceptibility to bacteria adhesion. In contrast previous research, the results illustrated that nano-silver/ ZrO₂ composite has larger quantities cell growth. SEM observed was consistent with the cell proliferation activity.

Combination of Er:YAG and a-PDT Laser in Periodontal Treatment

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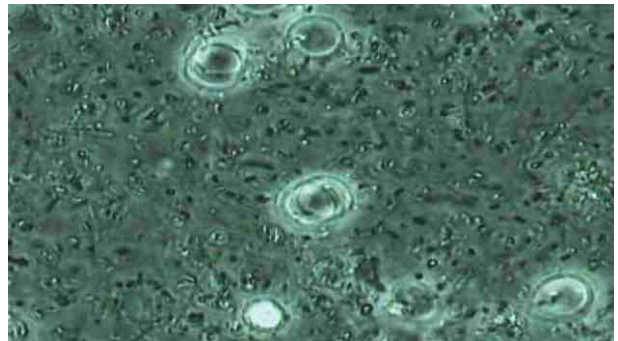
Basic Data

- Name : 劉 × 珠
- Sex : female
- Age : 47 yrs
- C.C : swelling over 45x47 area, masticating pain referred from my colleague
- Medical history
 - No systemic disease
 - No Drug allergy
- Past dental history
 - 37 implant
 - 47x45,17x15,12,11,21,22,27 crowning
 - 14,12,11,21,22,27 Endo. T'x

X-ray pre-OP



Micro. Before a-PDT



Micro. of Pre-OP 劉○珠

Diagnosis

- 47 advanced periodontitis with bony resorption nearly to root apex.
- Pocket depth = 10 mm
- Hopeless tooth, but p't wanna try to keep it.

Treatment Planning

- Laser assisted new attachment procedure
- Combine a-PDT procedure after 3 days
- F/U 1,3,6,24 months



Excessive pocket depth



Er:YAG 2W,15%H2O,30%air



De-epithelium

Antimicrobial Photodynamic Therapy



3days post-LANAP finished

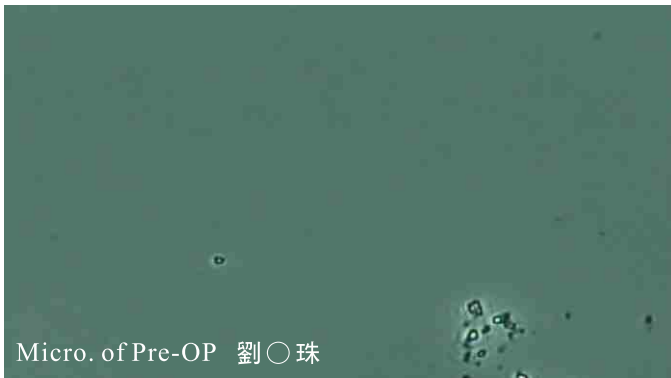


Photosensitizer injection



660nm Diode laser

Micro after a-PDT



Prognosis

- Immediate relief of clinical symptom sign after combination treatment of Er:YAG Laser & a-PDT
- Reduction of probing pocket depth to 4mm in 3 months follow-up appointment.
- A 5mm regeneration of bony defect was detected in 6 months follow-up appointment.

Discussion

- In LANAP, over de-epithelium easier to get a new attachment. combining a-PDT will get better result.
- a-PDT as an adjunctive treatment in addition to In LANAP for the treatment of periodontitis has been shown to be clinically useful. The underlying mechanism of photodisinfection is the targeting and the elimination of the bacteria most responsible for the progression of periodontal disease. In clinical studies it show better outcome in some cases. In the future PDT may be the choice of treatment for patient and dentist before surgical therapy.