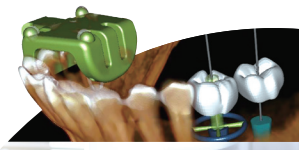

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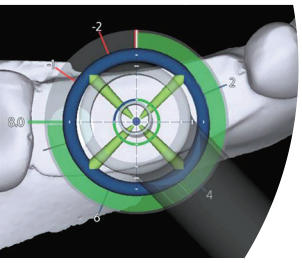

P01

使用 Lysogeny 培養液進行離體唾液菌相培養分析之前導研究

Ex-vivo investigation of human salivary microbial growth with lysogeny broth for translational research-a pilot study

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口腔菌相調節能改善失調的微生物生態系並促進口腔健康。唾液菌相中含有造成口腔疾病之口腔致病菌含量與組成，因此成為改善口腔健康相關臨床試驗的研究焦點。然而，試驗若未經詳加規畫與驗證，會得到不可信的菌相組成結果，進而造成大量人力、物力的浪費，凸顯前導試驗與品質管制的重要性。因此，本前導研究希望能透過使用微生物培養最常使用的 Lysogeny 營養液，建立唾液菌相離體培養模型與培養口腔菌相組成鑑定，供未來離體菌相調節試驗所用。透過宏觀基因組定序（Metagenomics）分析 16S rRNA V3-V4 高度變異區的序列，比較培養前後的菌相組成。在七位患有嚴重型牙周炎病患之唾液菌相中，發現培養前後的唾液菌相組成與豐富度發生顯著變化。Lysogeny 培養後，唾液中變形菌門組成比率由 20.92% 升至 46.81%，奈瑟氏菌屬由 14.43% 升至 33.88%，與厚壁菌門則由 42.39% 降至 22.84%。而牙周炎相關的致病菌在經 Lysogeny broth 培養後，擬桿菌門相對豐度由 8.94% 降至 6.21%；卟啉單胞菌屬則由 6.25% 降至 4.23%。與齲齒相關的致病菌，副流感嗜血桿菌由 3.19% 升至 6.49%、唾液鏈球菌由 10.71% 降至 7.17%。藉由唾液菌相培養相對豐度的消長比較，顯示 Lysogeny broth 對特定菌種能提供良好的培養環境，適合監測特定菌種於菌相調節作用的變化。

P02

Axl 在口腔癌中調控機制及其影響

Regulatory Mechanisms and Impacts of Axl in Oral Cancer

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背景／目的：探討口腔癌中酪胺酸激脢 Axl 的調控及其對癌細胞之影響

材料方法：在本研究中，我們透過細胞實驗與人體組織分析，研究 Axl 是否能進入細胞核，並進一步研究了 miR-34a 在口腔癌細胞中透過 Axl/Akt/GSK-3β 途徑的調節作用。

結果：我們的實驗結果證明了 Axl 進入細胞核。並且，透過突變的核定位信號的實驗，顯示減少細胞核內 Axl 的量可以降低癌症細胞的惡性程度。同時，減少細胞核內的 Axl 增強了對輻射和順鉑（一種主要的化療藥物）的敏感性。這表明 Axl 進入細胞核在增強癌症的惡性中有重要作用。另外，我們的研究發現口腔癌細胞中內源性 miR-34a 和 Axl 水平呈現反向關係。過度表達 miR-34a 顯著減少了這些細胞的惡性，同時也導致 Axl mRNA 和蛋白質表達的下降。

結論：我們的研究證實了 Axl 進入細胞核在癌症惡性中的重要性，以及 miR-34a 在口腔癌細胞中，特別是透過 Axl/Akt/GSK-3β 途徑來調節細胞惡性度。我們的結果提供針對 Axl 的核轉位和調節 miR-34a 的表達以限制癌症的進展並增強治療效果。

P03

評估雷射表面織構處理之鈦鋯鉭鍍膜的抗菌性與生物相容性

Biocompatibility and Antibacterial Effect of the Laser-Surface-Treated Titanium-Zirconium-Tantalum Coating

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先前的研究證實鈦鋯鉭鍍膜具有抗菌能力，同時也能提升生物相容性。因此本研究在鈦鋯鉭鍍膜表面進行雷射表面織構處理，並觀察是否會影響其抗菌性與生物相容性。本研究以鈦六鋁四釩做為基材，將鈦鋯鉭鍍製在基材表面。在鍍膜表面利用雷射刻劃圓孔、直線與網格等圖形，並改變其雷射間距，總共評估六種不同的雷射樣本，以未雷射之鈦鋯鉭鍍膜樣本做為對照組。抗菌性分析選用 Staphylococcus aureus，評估 24 與 48 小時之抗菌能力。生物相容性選用 L929 細胞，以 MTT assay 評估 24 小時細胞毒性，以及 24 與 48 小時細胞存活率。細胞存活率實驗是將細胞培養在浸泡試片 72 小時的培養液中，而細胞毒性實驗則是直接將細胞培養在試片表面。結果顯示雷射表面織構處理之樣本，其抗菌能力並不顯著。在生物相容性方面，雷射表面織構處理之樣本其細胞毒性比對照組高，然而細胞存活率比對照組優異（P<0.05）。雷射表面織構處理無法提升鈦鋯鉭鍍膜之抗菌能力，卻可以改善其細胞存活率，創造出更利於細胞生長的環境。

P04

氧化鎂表面改質對豬骨移植材之研究

Investigation of the Effects of Magnesium Oxide Surface Modification on Properties of Porcine Bone Grafts

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Porcine bone grafts are widely recognized for their biocompatibility for guided bone regeneration. This study aims to enhance the bioactivity of porcine bone graft with coating magnesium oxide (MgO) on its surface by hydrothermal treatment. After producing porcine graft, we use hydrothermal method to coat different concentration MgO including 0, 2, 5 mM, and there would be 3 experimental groups. A comprehensive evaluation is conducted using pH value assay, SEM, image processing, EDX, FTIR, immunofluorescence, MTT and ALP assay. The MgO-coating leads to an approximate 5% increase in magnesium weight percentage on the graft surface. After image processing, Ra and Rq value of MgO coated porcine graft which is roughness parameter are all higher than porcine graft. In immunofluorescence, MTT and ALP assay indicate that 5mM MgO coated porcine graft has the highest cell proliferation and ALP. That is to say the biocompatibility of 5mM MgO coated porcine graft is better than porcine graft. In conclusion, 5mM magnesium oxide coated porcine bone graft has the great potential as biocompatibility and bioactive graft for guided bone regeneration.

P05

三維列印多孔鈦合金支架於仿發炎環境之表面耐蝕特性

Characteristics of surface corrosion resistance of 3D-printed porous Ti alloy scaffolds in simulated inflammatory environment

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醫用金屬植體植入體內即引發發炎反應，此時植體周圍會產生活性氧物質（reactive oxygen species）（如 H2O2）與酸性微環境，進而影響植體表面保護膜的耐蝕性質。因此，本研究利用含 150 mM H2O2 之酸性（pH 5.2）模擬人體體液來模擬發炎環境，探討仿發炎反應環境對表面接枝第一型膠原蛋白之三維列印多孔鈦鈮鋯錫（Ti-24Nb-4Zr-8Sn, Ti2448）合金支架表面耐蝕性質的影響。藉由分析材料的動電位極化曲線、定電位特性、電化學交流阻抗、表面膜特性及離子釋放量可知，仿發炎環境會降低多孔 Ti2448 支架耐蝕性質；然而，經表面處理之 Ti2448 支架會快速生成約 200 μm 之緻密且具保護性的表面鈍化膜，成分以抗蝕能力佳的 TiO2 及 Nb2O5 為主，顯著減緩 H2O2 存在與酸性環境對耐蝕性質不利的影響，降低金屬離子的釋放量。經表面處理之 Ti2448 支架在仿發炎環境之電化學等效電路包含兩個電阻／電容迴路，分別為具保護性的內層膜及較不具保護性的外層膜。綜合上述，表面接枝第一型膠原蛋白之 Ti2448 支架能有效提升在發炎環境中的耐蝕性質，研究結果有助於鈦金屬支架植體未來臨床的應用。

P06

比較不同列印方向和材料之3D列印下顎前置裝置止鼾牙套精準度

Comparing the Accuracy of 3D Printing Mandibular Advancement Device with Various Printing Orientations and Materials

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Obstructive sleep apnea (OSA) is a prevalent disease that manifests frequently in people who are elderly, male, overweight, or have craniofacial and upper airway abnormalities. Various therapeutic modalities, such as pharmacotherapy, continuous positive airway pressure(CPAP), surgical interventions targeting the hypoglossal nerve and upper respiratory tract, and the use of oral appliance, are utilized in clinical treatment. In instances where patients are unable to tolerate protracted CPAP use, the use of a mandibular advancement device may be a viable intervention for mitigating the symptoms of hypoxia during sleep. In the experiment, two printing technologies, namely Stereolithography (SLA) and Material Jetting (MJ), were used to produce mandibular advancement device at varying angles (0 degrees, 45 degrees, and 90 degrees). Utilizing a desktop scanner, these printed objects (n=5) were subsequently converted into three-dimensional files. By utilizing 3D imaging software, the comparative accuracy of various mandibular advancement device can be evaluated. The results indicate that MJ Group 0 had the highest average accuracy values, whereas the SLA Group 90 displayed the lowest average accuracy values. This research shows the accuracy of the mandibular advancement device is affected by the printing orientations and materials, and providing clinicians with a reliable point of reference during the fabrication process.

P07

雙磷酸鹽類與單株抗體使用後引發顎骨壞死的治療之臨床成果

Outcomes of Clinical Treatment between Bisphosphonate-and Denosumab-Related Osteonecrosis of the Jaws

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Bisphosphonates (BPs) act as osteoclast inhibitors to manage osteoporosis, osteolytic bone metastases and anticancers. Denosumab is a fully human monoclonal antibody for treatment of osteoporosis designed to inhibit RANKL (RANK ligand), a protein that acts as the primary signal for bone removal, for treatment of in giant cell tumors, multiple myeloma with bone metastases and prostate cancer. This study collected 20 patients, included 13 patients of bisphosphate-related osteonecrosis of the jaws (BRONJ) administrated zometa, and 7 patients denosumab-related osteonecrosis of the jaws (DRONJ), administrated Prolia (X-geva). Both extraction and prosthesis are two risk factors were induced BRONJ and DRONJ in this study. Adopting conservative treatment, including antibiotic coverage (Augmentin 1 gram or Unasyn 375 milligrams, 1 tablet twice per day) for 2 to 4 weeks, antibacterial solution irrigation daily 30 cc of 0.1% chlorhexidine solution for 5-7 times with the total amount of solution being 200 cc. Minor surgical debridement was performed by removed with a cotton plier or by a high speed hand piece with a diamond bur if they attached to the adjacent bone. The mean duration to achieve complete remission of BRONJ lesion was 14.9±2.1, 17.4±1.8 months for patients of BRONJ and DRONJ respectively, student's t-test showed no significant differences (p=0.442). Conservative treatment can result in successful treatment of BRONJ and DRONJ lesions. Treated for patients with DRONJ didn't needs a shorter mean duration to achieve complete remission than patients with BRONJ by conservative treatment.

P08

使用國產優良植體重建毀損齒列

Reconstruction of mutilated dentitions with domestic high-quality implants

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背景與目的：因材料與技術的進步，伴隨生活水準的提升，牙科植體已成為重建缺牙區或取代無法保留牙齒普遍選項之一。本文為探索國產優良植體應用於臨床治療系列病例之一，觀察台灣自有品牌 - 皇亮生醫人工植體（TISS implant system）之穩定性及邊緣骨變化。

病例報告：經適當的診斷與治療，本案例植牙區皆測得良好的植體穩定度（implant stability quotient, ISQ ＞ 65）。偵測植體邊緣骨變化，顯示甚少的骨吸收（0.2~0.6mm）。五年的病例追蹤與分析顯示此國產植體具有高穩定度及成功率，臨床表現不亞於歐美品牌植體。

討論：雖植體可能優化治療，但許多術前考量與精細的手術與定位乃成功要件。正確的植體位置及適量的植體周圍軟硬組織等因素皆有助於植體長期的成功與穩定。實際執行臨床試驗，分析國產植體之臨床表現，證實台灣研發生產的植體具有優良的穩定性及成功率。

結論：希望系列性的病例追蹤提供臨床佐證資料能提高國產植體的使用率，並將台灣植體推展至國際市場達到產品推廣及學術研究之目的。

P09

使用摻鍶雙相磷酸鈣在鈦表面進行水凝膠塗層

Hydrogel Coating On Titanium Surface via Using Strontium Incorporated Biphasic Calcium Phosphate (BCP)

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Surface modifications at the nanoscale level on the micro rough titanium surface showed promising results in the bone healing process and implant stability. Aim; Since both strontium (Sr) and biphasic calcium phosphate (BCP) influence the osseointegration positively, the combination of Sr and BCP assume to have a synergistic effect on the osteogenic activity. Materials and methods; Titanium surface is modified by sandblasting, acid etching and alkali treatment. Followed by coating with strontium incorporated BCP in four different percentages 1%, 3%, 5% and 10% of sodium alginate. Result; In SEM analysis, the smooth surface of titanium (Ti) changed into irregular valley and some scratch area prominently deepened after sandblasting. Followed by acid etching, pits and fissure were appeared in low magnification. After alkali treatment, the septums between pits became thinner and showed as spider web structure. Sol-gel coating displayed nodules like appearance. In EDS analysis, atom percent of strontium became higher after coating with sol-gel. Strontium atom percentage was elevated up to double when sodium alginate percentage was reduced. In contact angle measurement, properties of hydrophilicity increased after alkali treatment. However, the hydrophilicity decreased after the sol-gel coating. Infrared spectroscopy detected C-O stretching functional groups, indicating the presence of amine groups on treated samples. Conclusion; The physical properties of the Ti surface enhanced with the increaement of Sr, Ca, P atomic percentage along with the nodular surface appearance after coating with strontium incorporated BCP gel, which will also improve the early osteogenic activity of dental implant.

P10

以丙烯胺表面沈積法增強植體氧化鋯的骨整合性能

Improvement of osteogenic properties of zirconia ceramic via glow discharge plasma-enhanced amine organic compound deposition

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Osseointegration potential is greatly depended on bone cells interactions with the dental implant surface.

Background: Zircon ceramic has bioinert surface and poor osseointegration properties. Aim: The aim of this study was to enhance bioactivity of zirconia cerami dental implants by functionalizing their bioinert surfaces with allylamine.

Material and Method: Glow discharge plasma (GDP)-Argon first cleaned the zirconia surface. Followed by allylamine plasma treatment in three different wattages of 50W, 75W, and 85W to get the final samples.

Result: After surface treatment, a granular bulbous pattern was observed, and infrared spectroscopy detected the aromatic C- C-O stretching, N-H stretching, C ≡ C and C-H functional groups, indicating the presence of amine groups on treated samples.

Surface roughness became higher, hydrophilicity was improved after the surface modification, and the MTT assay showed the highest cell viability for the A50 group. Cell differentiation marker is also in consistent with MTT analysis, exhibiting that the amine-grafted disk of the A50 group had the highest alkaline phosphatase activity, which in turn encouraged the late-stage mineralization activity on Day 21. Up-regulation of osteogenic-related mRNA expression from Day 1 to Day 21 can be observed from RT-qPCR data of ALP, OC, DLX5, SP7, OPG, and RANK biomarkers.

Conclusion: The functionalization of zirconia ceramic surfaces with allylamine enhanced their physical and biological properties, significantly promoting bioactivity in osteoblast-like cells, including up-regulation of gene expression, and proved to be utilized of these modified surfaces for future dental implant applications.

P11

應用導航新穎技術移除口腔顎面區域異物

A Novel Intraoperative Navigation for Removal of Foreign Body in Oral and Maxillofacial Region

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3 三軍總醫院齒顎矯正暨兒童牙科暨特殊需求者牙科　4 國防醫學院生物醫學工程學科

Clinicians frequently encounter unexpected situations of foreign bodies into the soft and hard tissues in oral and maxillofacial region, which are commonly attributed to various causes such as iatrogenic factors, traffic accidents, gunshot injuries or explosions, etc.

The patients may experience pain, paresthesia, inflammation or infection as a result. During surgical procedures, the removal of foreign bodies typically requires lots of time in order to preserve the normal tissue and prevent damage to the vital structure. In the context of a restricted surgical perspective, the excessive excision of neighbor tissue or creation of excessively large wounds frequently result in subsequently complications and prolonged recovery period. Navigation systems and digital technologies provide the capability for precise positioning by enabling preoperative simulation of the surgical path. The advanced novel approach not only may shorten surgical period, but also minimize the morbidity, therefore facilitating the postoperative recovery. Here we present a 61-year-old female suffered from pain and numbness over right lower face. Foreign body of right ramus and osteomyelitis of right mandible were diagnosed after physical and radiographic examination. With dynamic navigation system (X-Nav Technologies, LLC, Lansdale, PA, USA), cone beam computed tomography and intra-oral scanners, we reconstruct the patient's jawbones and conduct virtual surgery using 3D imaging files (digital imaging and communications in medicine [DICOM]) and stereolithography (STL) files prior to the actual operation. Under general anesthesia, a foreign body was extracted and debrided smoothly with the aids of these device. The postoperative examination disclosed that the removed foreign object was a broken fissure bur with dead bone. The patient's lower facial numbness significantly improved, and she experienced without any complications in 6 months follow-up. This case presentation provides clinicians with an efficient and effective method for removing foreign body in oral and maxillofacial regions by minimally invasive manner.

P12

牙科植體之穩定性商數（ISQ）與穩定性測試（IST）間的關連測試 – 臨床研究

Investigation of the relationship between Implant stability quotient (ISQ) and Implant stability test (IST) at surgical dental implant-A Clinical study

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In the past decades, dental implantology has become one of the most widely used therapeutic options to treat edentulous patients. The well-established mechanical stability of implant forms the biological basis for their successful use in daily life. In clinical practice, there are many ways to determine the time frame for practical implant loading and as a prognostic indicator for possible implant failure. Therefore, among the methods commonly used today, measuring the stability of lamellar bone around implants has been standardized by various measurement techniques. This time we use the way of Periotest and Resonance frequency analysis (RFA) which are Implant stability test (IST) and Implant stability quotient (ISQ). First, we carried out IST measurement of the implant when the implant surgery was completed (for the first time) and every week after the operation and observe the stability of the implant until the 6th week after the operation, a total of 7 times.

Second, similarly, when the implant surgery was completed (for the first time) and at 1, 3, 6, and 12 months after surgery, the ISQ of the implant is measured to observe the stability of the implant, a total of 5 times. Third, measuring the ISQ, MBL and PBL of the implant at 1, 3 and 6 months after implant. The dental implant surgery planned was a perfect success.

The dental implant process went smoothly, and all steps and measurements were completed. The subjects had no adverse reactions during the return visit period, and the dental crown was successfully installed and returned to normal life, as measured by IST and ISQ over a period of 12 months. Through the IST and ISQ test, we found that the Level of ISQ was higher than IST, and the implant stability may decrease at first 6 week. The results revealed that the IST and ISQ, both noninvasive diagnostic devices, were useful and comparably reliable, showing a strong association with each other in assessing implant stability. We found ISQ measuring is preferred before we deliver the restoration of the implant, and executing IST is more recommended after deliver the restoration of the implant,

P13

安格氏骨性三級異常咬合患者雙頷正顎手術的上呼吸道變化評估

Upper airway changes after bimaxillary orthognathic surgery in Angle's skeletal Class III Patients

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嚴重下頷前突患者的治療選擇，主要治療為下頷後退手術。有研究指出，無論是否同時做上頷前移或只做下頷後退手術，都可以引起上呼吸道空間（upper airway space UAS）的變化。本研究目的在評估安格氏骨性三級異常咬合患者接受雙頷正顎手術（上頷前移和下頷後退）以及下頷成形術後，口咽區上呼吸道的變化。本研究的樣本包括 20 名患者（10 位男性及 10 女性）的 40 次錐形束電腦斷層掃描（cone-beam computed tomography）。放射線檢查在手術前及手術後進行。上呼吸道空間體積、矢狀面面積、矢狀面長度與最小軸向面積及寬度、深度和位置是在 Dolphin Imaging TM 軟體（11.5 Premium 版本）的輔助下進行測量。運用 Shapiro-Wilk 檢驗與 Student's paired t-test 檢驗對實驗數據進行分析，結果顯示所有評估項目的測量值在統計學上都沒有顯著差異（P>0.05）。患者接受雙頷正顎手術和下頷成形術後，口咽部上呼吸道空間並未觀察到明顯變化。

P14

次氯酸抗菌劑在體外之細胞毒性及抗菌力

In vitro cytotoxicity and antibacterial activity of hypochlorous acid antimicrobial agent

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研究目的

The purpose of this study was to evaluate the in vitro cytotoxicity and antibacterial activity of different concentrations of hypochlorous acid (HOCl).

研究方法

Five different concentrations (100, 200, 300, 400, and 500 ppm) of HOCl were evaluated for their antimicrobial efficacy against Gram-negative (A. actinomycetcmcomitans and P. gingivalis) and Gram-positive bacteria (S. mutans and S. sanguinis) after treatment for 1 and 10 min. Sodium hypochlorite (NaOCl) and chlorhexidine (CHX) were used as positive controls. In addition, HOCl was examined for L929 cytotoxicity and RAW 264.7 growth.

結果（含數據和統計方法）

The bacteriostatic ratio of NaOCl was comparable to that of CHX and significantly (P<0.05) higher than that of all HOCl solutions. Higher HOCl concentration had significantly (P<0.05) higher antibacterial effect, and the bacteriostatic ratio of 10 min treatment was slightly higher than that of 1 min treatment. CHX and NaOCl seeded into L929 cells resulted in low cell viability with only 30-39%, much significantly (P<0.05) lower than all HOCl groups (greater than 80%). All HOCl solutions met the recommendations of ISO 10993-5 and showed no cytotoxicity, although there was a concentration-dependent decrease in cell viability. All antimicrobial agents showed the same trend of response to RAW 264.7 as L929.

結論（請以畫線明示之）

Within the limit of this study, 400 ppm HOCl disinfectant may be a potential antimicrobial candidate for mouthwash, endodontic irrigants, and periodontitis treatment.

P15

植體周圍炎的治療－利用齒槽嵴保留和重新植牙

Treat peri-implantitis by alveolar ridge preservation and re-implantation

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Background: Dental implant is one of the reconstructive therapies for missing teeth, and a common complication is peri-implantitis. Peri-implantitis is an inflammatory process that affects the tissues surrounding the dental implant and leads to bone loss, and in severe cases, even implant removal. The purpose of this case is to treat peri-implantitis using alveolar ridge preservation (ARP) and re-implantation with a new dental implant.

Case report: A healthy 40-year-old female was referred to periodontics department to treat peri- implantitis of 36 implant. Severe alveolar bone loss was observed on both the mesial and distal aspects of the dental implant during dental radio-graphic examination. Clinically, there was also a probing depth of 8-9 mm around the implant. After discussing with the patient, she decided to remove the dental implant and performed an alveolar ridge preservation procedure simultaneously. Following atraumatic extraction of 36 implant and thorough debridement, 0.7 cc freeze-dried bone allograft (FDBA, LifeNet Health OraGRAFT®) and platelet-rich fibrin (PRF) were applied to fill the severe defect in flapless manner. During the tissue healing period, the patient also underwent orthodontic treatment. After the ARP 2.5-year, the preoperative cone-beam computed tomography (CBCT) showed the bone width and height were 7 mm and 15 mm, respectively. A Straumann® Standard Plus implant in size of 4.1 mm x 10 mm was installed according to the instructions and the bite-wing (BW) radiography after surgery showed flat bone level.

Results: After a 6-month recovery period following the surgery, the alveolar bone level of implant was stable and a screw-retained crown was delivered.

Conclusion: ARP and re-implantation might be a stable resolution of peri-implantitis.

P16

牙周病患者患有口腔癌之勝算比：系統性文獻回顧及統合分析

The Odds Ratio of Concurrent Oral Cancer in Patients with Periodontal Disease: A Systematic Review and Meta-Analysis

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牙周病與口腔癌在台灣都有高盛行率，牙周病與許多性統性疾病有關，包括心血管疾病及關節炎。許多研究指出，患有口腔癌的患者也多暴露於同樣是牙周病的風險因子，如吸菸及飲酒，這引起我們對於這兩種疾病的關注。我們進行了系統性文獻回顧及統合分析，以驗證是否存在一群同時患有牙周病及口腔癌的患者。結果：我們納入了 12 個地區的 16 項臨床研究，共計 27,628 名參與者，並且繪製森林圖、計算勝算比；粗勝算比（crude OR）=3.35，95%CI：2.63-4.26；然而，對風險因子調整後的勝算比（adjusted OR）=2.33，95%CI：1.70-3.20，顯示牙周病患者中有比較高比例患有口腔癌。然而，本研究主要的限制是納入各文獻的異質性。結論：牙周病患者可能會有較高比例患有口腔癌，對於此群體的臨床考量應引起更多的關注，以利跨科協同的照護。

P17

以非手術性根管再治療及齒內美白修復次發性感染之變色失活前牙 – 病例報告

Non-surgical Root Canal Retreatment and Intra-coronal Bleaching of Stained Root-filled Teeth with Secondary Endodontic Infection: A Case Report

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本病例報告為一位年輕女性，主訴上顎正中門牙不舒服，且頰側牙齦有膿包，舊有樹脂填補物及齒質變色明顯，希望尋求長久穩定的復形物。經非手術性根管再治療及齒內美白，將色澤暗沉之上顎正中門齒漂白，後續進行美觀分析，並於臨床模擬數位蠟形，與患者溝通視覺協調，以全瓷冠修復齒質，術後追蹤無臨床症狀，且 X 光影像顯示根尖病灶癒合。牙齒變色後，需針對染色成因作有效處置，內因性染色以齒內美白搭配贋復物製作，可達到美觀與功能修復的結果。

P18

牙科實習醫學生臨床操作前使用口外牙齒進行預臨床訓練

Preclinical Training for Dental Interns Using Ex-vivo Teeth Before Clinical Procedures

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本研究探討牙科實習醫學生使用口外牙齒的預臨床訓練效果。在牙醫學中，預臨床訓練旨在幫助學生熟悉操作技巧，增強自信，提供他們臨床所需的基礎知識。研究方法使用傳統口外牙操作配合 X 光片訓練。近兩年資料統計結果顯示，110 學年度有 16 名實習醫學生，學前、學中和學後的平均分別為 60.9 分、61.3 分和 62.2 分；111 學年度的 18 名實習醫學生，這三個階段的平均分別為 66.6 分、71.9 分和 69.7 分。問卷調查中，110 學年度的學生對訓練有 100% 的滿意度，而 111 學年度為 88.9%。雖然學生的自信心和滿意度有所提高，但在知識測試方面，學中和學後的成績與學前相比並沒有顯著差異。未來研究將採用更先進的 3D 列印模型等技術，以提高預臨床訓練的效果。

P19

牙技師操作陶瓷復形物表面處理的初步調查報告

Preliminary survey of surface treatments on ceramic restorations by dental technicians

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由於陶瓷材料的選擇性增加、強度提高、且相較於樹脂材料不易變色等原因，陶瓷復形物應用在臨床上的比率增高。目前市面上最盛行的牙科陶瓷復形物是二矽酸鋰和氧化鋯，其結構不同、強度不同，也有不同的製程與處理方式。本研究為了解二矽酸鋰與氧化鋯兩種陶瓷在市場上的使用情形，採用問卷的形式匿名訪問臨床牙技師。問卷總共有 15 個問題，包括工作年資、如何使用二矽酸鋰和二氧化鋯，細項的部分有：復形物的類型、復形物的表面處理、復形物損壞的形式、復形物的壽命、和復形物的品牌。92 份問卷結果顯示，受訪牙技師所製作氧化鋯復形物大都有全氧化鋯冠（98.8%），表面處理的部分，比較多的是二氧化鋁噴砂（55.6%）和二矽酸鋰塗層（33.3%），曾發生過氧化鋯復形物失敗的比率是 79%。二矽酸鋰復形物在牙技師的使用上，有嵌體（82.9%）、貼片（84.2%）、或全冠（72.4%），表面處理的部分，比較多的是氫氟酸（57.9%）、二氧化鋁噴砂（50%），曾發生過二矽酸鋰復形物失敗的比率是 69.7%，結果顯示牙技師對二矽酸鋰的處理，較氧化鋯一致。

P20

牙醫師操作陶瓷復形物表面處理與黏著系統的初步調查報告

Preliminary survey of surface treatments and bonding systems on cementing ceramic restorations used by dentists

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目前牙科陶瓷的選擇以二矽酸鋰與氧化鋯陶瓷為主。二矽酸鋰玻璃陶瓷具有足夠強度與高度美觀；而氧化鋯陶瓷具有出色的機械性能及生物相容性，二者適用於不同牙科復形治療。正確的黏著方法是復形物成功的關鍵，由於材料不斷推陳出新，而牙醫師接受的資訊端不同，故黏著的表面處理並無一致的操作規範。本研究以匿名調查目前臨床牙醫師操作氧化鋯及二矽酸鋰兩類陶瓷復形物的表面處理及黏著系統選擇。問卷設計 19 個問題，囊括氧化鋯及二矽酸鋰陶瓷廠牌、表面處理方式、黏結系統的選擇以及製作後是否有失敗狀況，初步共收集 74 份有效問卷，涵蓋診所與醫院醫師。填答者中臨床工作年資大於 20 年為最多；氧化鋯及二矽酸鋰復形物較多的有全冠及嵌體；復形物黏著前內面處理氧化鋯以二氧化鋁噴砂最多（55.4%），二矽酸鋰則是氫氟酸最多（74.2%）；復形物內面黏結劑氧化鋯是 3M Single Bond Universal 最多（56.8%），二矽酸鋰最多是 Monobond® N（45.5%），復形物黏結劑氧化鋯最多是 RelyX U200（81.1%），二矽酸鋰為 Variolink（59.1%）；兩種材料失敗情況最常見是斷裂。結果顯示牙醫師在表面處理中氧化鋯較二矽酸鋰分歧，但兩種材料在黏結劑使用則有較多重複的選擇。

P21

不同透明度氧化鋯下光聚合樹脂黏合劑聚合程度評估

Polymerization of Light-curable Resin Cement under Zirconia of Different Generations

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Zirconia has evolved into different generations to attain high translucency. The objective of this study was to assess the polymerization efficiency of resin cements under zirconia of different generations. Six zirconia ceramics of three generations to test were: (1) conventional zirconia: Cercon Base (CB, Dentsply); (2) 2nd generation high-translucent zirconia: Vita YZ-HT (VH, VITA Zahnfabrik) and Cercon HT (CHT), and (3) 3rd generation super-translucent/extra-translucent zirconia: Vita YZ-ST (VST), Cercon XT (CXT), and Vita YZ-XT (VXT). They were fabricated into zirconia disks of 0.5 and 1.0 mm thickness. A light- curable resin cement (Variolink N base, Ivoclar Vivadent) was filled into a metal wafer and placed on a black background. The cement was covered by a transparent strip and the zirconia disks, then irradiated by a LED light for 40s. Vickers microhardness were measured on the surfaces of cements. The results showed that cement without obstacles presents the highest microhardness (15.38+0.29 VHN). For 0.5-mm thick disk groups, CXT and VXT had the highest microhardness values, followed by VST, VHT, CHT, and CB. For the 1.0-mm thickness groups, VXT showed the highest microhardness. With the results, the translucency and thickness of zirconia affects the polymerization of resin cements. Under 1-mm thick disk, the polymerization is significantly different in three generations. VXT exhibited the highest microhardness values.

P22

創新牙科氣溶膠移除裝置

A Novel Device for Dental Aerosol Mitigation

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INTRODUCTION: Dental aerosols unavoidably mediate pathogen transmission from patient to dentist, hygienist, and nearby personnel exposed in a dental office. There is an urgent but unmet need to distribute an affordable dental aerosol-mitigation strategy on a large scale during the pandemic.

OBJECTIVES: This invention aimed to provide a feasible dental aerosol mitigation device utilizing the built-in vacuum on the dental unit.

METHODS: We simulated patient-derived aerosols that may occur during dental treatment by combining commercially available fluorescent particles and a nebulizer. The aerosols distributed into the operator's breathing area were collected by air sampler. The fluorescent signals of collected particles were excited by ultraviolet lasers and further quantified by flow cytometry, fluorescent microscope, and nanoparticle analyzer. Following the protocol of Scaling, scaling with a perioral aerosol removing device (PARD), or scaling with a traditional extraoral dental vacuum (EDV), the samples were collected to compare the aerosol mitigation efficacy. The patient-derived dental aerosols were further interrogated with the same protocol.

RESULTS: Both PARD and EDV significantly reduce the dental aerosols ($p<0.05$) in the simulated scenario and human subjects. The PARD provides better small-size aerosol-mitigation efficacy on the manikin model ($p<0.0001$) and human subjects ($p<0.0001$).

CONCLUSION: This invention proposed an affordable and efficient PARD concept that allows worldwide distribution for dental aerosol mitigation to protect the safety of dental treatment during the post-pandemic era.

P23

前牙美觀區考量－上顎正中門齒變色、不對稱及側牙間隙以鉺雅鎔雷射牙齦切除術、陶瓷貼片及氧化鋯牙冠復形：病例報告

Anterior Aesthetics Consideration-Tooth Discoloartion, Asymmetry, Lateral Diastema using Er: YAG laser Gingivectomy and restorated with Porcelain Veneer and Zirconia Crown: A Case Report

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隨著現代牙科工具及觀念的演進，鉺雅鎔雷射在不同波長下針對軟硬組織切割之手術過程中產生極小的震動及熱傷害，使用在牙齦切除術上亦具有溫和傷害性低的特色。此病例報告為一 35 歲女性，因自覺前牙區不美觀前來就診，歸納患者前牙區不和諧的因素，左側上顎正中門齒先前根管治療過產生變色並且與左側側門齒間有側牙間隙、右側上顎正中門齒診斷為近心側鄰接面齲齒。比色紀錄後以研究用模型及蠟型重塑牙齒合理空間分配與外型，後續轉印修型並執行鉺雅鎔雷射牙齦切除術搭配臨時牙冠塑型牙肉一個月。最後以陶瓷貼片完成右側正中門齒、氧化鋯牙冠完成左側正中門齒，達成良好的前牙區美觀型態與遮色，並於 6 個月後追蹤良好。

P24

台灣結直腸癌患者診斷前的看牙頻率

The frequency of dental visits in patients prior to diagnosis of colon-rectum cancer: a population-based nested case-control study in Taiwan

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The objective of this study was to investigate the utilization of ambulatory dental services in patients with colon-rectum cancer (CRC) prior to their diagnosis using a population-based health claim database in Taiwan. From the Longitudinal Health Insurance Research Database 2010 (LHIRD 2010), we identified 4787 patients who were diagnosed with CRC from 2005 to 2013. We also obtained 19148 control subjects 1:4 matched on sex, 10-year age interval, and enrollment date from the Longitudinal Health Insurance Database. Both groups were retrospectively traced to 1997 to obtain any records of utilization of dental care services that occurred preceding the index date. The CRC patients' median of amount of outpatient visit in the 8 years before index date were higher than that of the control group in each year ($p<0.001$). Patients with CRC had higher annual prevalence of dental visits than the control group, especially in the past five years ($p < 0.05$). Although our results showed that dental visit and different dental treatments were not significantly related to CRC, we observed that some co-morbidities would affect the occurrence of dental diseases and CRC at the same time. We should know that oral health may be linked to CRC, and more researches are needed to confirm.

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探討以二苯乙烯苷刺激人類牙髓幹細胞產生之外泌體應用於傷口癒合與骨再生之效果

Effects of exosomes derived from THSG stimulated-hDPSCs on wound healing and osteogenic regeneration

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二苯乙烯苷是中藥材何首烏中的活性成分，具有降血脂、抗發炎等功效。本研究旨在探討二苯乙烯苷（2, 3, 5, 4'-tetrahydroxystilbene-2-Obeta-D-glucoside，簡稱 THSG）刺激人類牙髓幹細胞（human dental pulp stem cells，簡稱 hDPSCs）產生外泌體在細胞活性、傷口癒合和成骨分化的影響，並觀察其於大鼠骨缺損中組織修復的效果。首先評估不同濃度 THSG 誘導的外泌體（THSG-Exo）與 DPSC 外泌體（DPSC-Exo）對於老鼠前類骨母細胞（MC3T3）與人類牙齦纖維母細胞（HGF）的細胞增殖影響。結果發現 MC3T3 與 HGF 分別在 THSG-Exo（100μM）與 THSG-Exo（10μM）的條件下產生明顯的細胞增殖效果。傷口癒合試驗結果顯示 HGF 在 THSG-Exo 作用下，在第六天和第九天時缺口面積顯著縮小，且在第九天時缺口癒合超過百分之四十。骨分化實驗結果顯示 THSG-Exo 能讓 MC3T3 在第一週即誘發骨分化效果，並在第二週與第三週時觀察到更多鈣化結節。在大鼠上顎骨缺損的實驗模型中，THSG-Exo 讓骨缺損區域的骨容積、骨小樑厚度和骨小樑密度有顯著增加的情形。大鼠顎骨組織學切片的結果顯示 THSG-Exo 讓新生成骨區域的骨母細胞數量增加，也使得 OPN、PCNA、VEGF 的抗體表現增加。蛋白質體組成分析結果顯示，THSG-Exo 中內含多種骨分化、傷口癒合、組織修復相關蛋白質，例如 BMP-1、MMP-1 及 TSG-6。綜合以上，THSG 誘導 hDPSCs 產生的外泌體，不僅在體外實驗證實了有促使細胞增殖、促進傷口癒合與刺激成骨分化之能力，在體內實驗也證實有加速組織修復與骨再生的效果，合併蛋白質體組成分析結果證實 THSG-Exo 內含多種有利於組織修復的蛋白質。由此推論，THSG 能誘使 hDPSCs 產生更優質的外泌體，不論在質與量上皆有所提升，更有利於臨床上在傷口癒合、成骨再生、組織修復中的應用。

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探討一體式高透預染色多層氧化鋯在不同厚度下之光學與機械特性

Evaluation of the optical and mechanical properties of monolithic high-transparency pre-colored multilayer zirconia at various thicknesses

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一體式高透預染色多層氧化鋯（簡稱為 M-Zr）憑藉逐年改善的顏色梯度和透明度在臨床上逐漸成為趨勢，但其光學特性與機械強度之相互影響仍有待商榷。本研究旨在探討厚度差異對 M-Zr 光學與機械特性之影響。製備四種厚度（0.5/1.0/1.5/2.0mm）之 M-Zr 試片並使用數位比色儀進行顏色擷取以計算透明度（TP 值）；設計三個齒位（門齒－ 11、小臼齒－ 14、大臼齒－ 46）之牙冠解剖形態試片，每個齒位均有三種厚度（1.0/1.5/2.0mm），同時亦將齒軸傾角之變數納入考量，隨後使用萬能強度試驗機測量抗壓強度後觀察斷裂形貌。實驗結果證實厚度與 TP 值成顯著負相關（P<0.05），再將試片分為 cervical、body 和 incisal 並計算 TP 值，各區在不同厚度下之 TP 值也有顯著差異（P<0.05）。1.0mm M-Zr 在 incisal 之 TP 值為 14.34，與健康自然牙（15-19）極為接近（ΔTP<2）。三個齒位的抗壓強度與厚度均成顯著正相關（P<0.05），即使是 1.0mm 之 46 也具有遠高於臨床平均咬合力（300N）之抗壓強度（1357N）。在破裂形貌觀察中，11 多以裂紋呈現，14 與 46 則是完全破裂。M-Zr 在固定厚度下，從 cervical 到 incisal 充分表現出漸層透度特性，應用於前牙美學極具潛能；而在較厚的條件下，雖然犧牲些許透明度得到較高強度，但本實驗證實即使在 1.0mm 之厚度下，M-Zr 仍充分保有得以應用於後牙咬合乘載區之抗壓強度。

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病例報告：數位輔助製作之下顎附連體植體輔助覆蓋式義齒

Digitally assisted implant overdenture locator attachments for edentulous mandible-A case report

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We usually use conventional complete dentures as the treatment for an edentulous ridge. Conventional complete dentures ar an affordable and quick option for the edentulous ridge, but they may need to be more stable and may shift or slip during eating or speaking. The concept of locator implant-assisted overdenture is a stable dental prosthesis that utilizes a locator attachment system to replace missin teeth. It provides more excellent stability and retention than traditional dentures and distributes chewing forces evenly across the implants. However, implant-assisted overdentures require more time and money, involving a surgical procedure to place dental implants.

An 84 y/o male patient was a case of mandibular locator implant-assisted overdenture. After two implants were placed by an oral surgeon and waited four months for osseointegration. He was back to our prosthodontics department for denture fabrication. First, we used a desktop scanner to replicate his previous interim denture for vertical dimension and produced a copy denture for the final impression. Then delivered the male part of the locator. After the framework and denture try-in, we delivered the denture and picked up the female part of the locator with acrylic resin. With the aid of digital dentistry in this case report, time is significantly saved in both the chairside and the lab. By using CAD/CAM technology, and 3D printing, dental professionals can create precise digital models and designs, which can be quickly transferred to the lab for the fabrication of restorations. Additionally, the use of digital tools allows for the faster fabrication of prostheses, as well as more accurate and consistent results. Overall, digital dentistry can significantly improve efficiency and save dental professionals and patients time.

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病例報告：數位輔助製作之冠外彈性附連體

Digital-aided ERA removable partial denture: A case report

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1 補綴科

The fabrication of ERA dentures has always been a complex process, requiring meticulous execution of each step both during chairside procedures and in the dental laboratory. Effective communication between dentists and dental technicians is crucial but time-consuming. The procedure involves several stages, including primary impression, survey, tooth preparation, abutment impressions, check wax pattern, metal coping try-in, framework impression, metal framework try-in, denture try-in, ERA male part placement, and final delivery Beginners often encounter common errors such as undercuts and improperly aligned abutment walls during tooth preparation.

Additionally, a mistake often observed is the incorrect placement of the female part. It is essential to maintain oral hygiene and provide periodontal protection by keeping the female part approximately 1mm away from the gingiva. Typically, the wax pattern requires adjustments during chairside procedures to achieve the desired fit and function.

Our patient is a 54-year-old woman who is missing teeth 34, 35, and 36, and has declined the option of a cross arch prosthesis.

As an alternative, we proposed a unilateral removable partial denture with abutments at 32, 33, and 37. The design includes two ERA attachments at 33 (distal) and 37 (mesial), occlusal rests at 32, 33, and 37, a denture base, and a SLM titanium framework. In this case report, time is significantly saved in both the chairside and the lab with the aid of digital dentistry. The preparation can be checked instantly, and undercuts or unparallel walls can be corrected right away. The position of female part can be adjusted easily and precisely, and space can be analyzed more accurately. Moreover, in the patient's shoes, intraoral scanning is way more comfortable compared to the traditional impression technique.

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病例報告：功能軌跡生成術輔助設計植牙贋復

An implant prosthesis occlusion rehabilitation with functionally generated path-A case report

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Functionally generated path (FGP) is a technique that can completely record the occlusal surface of a single jaw and its relationship with the opposing teeth to help establish a balanced and functional occlusion of a complete denture. This technique can reduce the difficulty in designing the prosthesis's occlusal surface because it accurately duplicates the patient's jaw movements. Now FGP is broadly used not only in manufacturing removable and fixed dental prostheses but also dental implant prostheses. In the past, after the functional occlusion pattern was generated in the mouth, it need a series of complicated dental lab steps to fabricate the final prosthesis. This clinical repo describes the treatment of a 63 years old male patient with tooth 17 root fracture. A temporary implant prosthesis (ITI, 4.8mmx10mm, Straumann, Switzerland) was fabricated with Ti-base to reconstruct his dentition and the FGP technique to diminish dental lab procedure and delivery time. In the initial stage of the temporary implant crown, the occlusal surface is generated with FGP methods to obtain a representation of the opposing cusps' dynamic eccentric movements from centric relation. Then, this provisional crown was transferred to the laboratory to copy the pathway on the final prosthesis. In this way, we can design the custom implant crowns with proper occlusal design o the software that could remove occlusal interferences and delivery the best implant crowns. Currently, under continuous follow-up for up t 3 months, the implant is in steady condition, and the patient has stable occlusion and high satisfaction without any complaint.

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新式複合陶瓷之特性及使用雷射熔融製造之可行性評估

Characteristics of Novel Composite Ceramics and the Feasibility of Manufacturing by Selective Laser Melting

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複合陶瓷可以解決氧化鋯過硬的問題以及傳統切削製程上的浪費，使用三維積層製造應是克服前述難題的方法之一，但如何以選擇性雷射熔融（SLM）仍具有挑戰性。本研究依不同比例混合市售之二氧化鋯粉體與自行配製之磷酸鈉鈣粉體合成二氧化鋯－磷酸鈉鈣複合材料（比例分別為 7:3 與 9:1）以及有無添加碳化鈦進行實驗設計。SLM 使用二氧化碳雷射，並設定雷射功率在 20 至 70 瓦特，雷射掃描速率在 10 至 30mm / s。實驗結果顯示，大多數的雷射加熱條件能量過高造成材料與基板損害，少數條件得到多孔性的結構，而在粉末混合比例 9:1 及功率 70 瓦、速率 10mm / s 的 SLM 條件下，得到了固結的樣品。本研究成功合成磷酸鈉鈣 - 二氧化鋯複合材料並發現，適當的磷酸鈉鈣含量可以降低二氧化鋯燒結體的硬度。在特定的 SLM 參數（功率 70 瓦特和速率 10mm / s）下，可以得到固結的樣品。後續研究將進一步優化 SLM 製程參數，並再把固結的樣品成型化。

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顳顎關節障礙症候群患者其張口軌跡類型和張口度及自覺下顎張口受限之相關

Correlation between mouth opening trajectory type and mouth opening and mandibular mouth opening limitation in patients with Temporomandibular Disorder

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顳顎關節障礙症候群患者（Temporomandibular Disorder, TMD）多有張口受限和疼痛的臨床表徵。
研究目的：探討 TMD 患者其張口軌跡和張口度及自覺下顎張口受限之相關。
研究方法：本研究為橫斷性研究，對象為經醫師診斷為 TMD 之患者且介於 20-65 歲，時間為 2022/7-2023/3，地點為高雄醫學大學附設中和醫院牙科部。資料收集包含臨床檢查（含張口軌跡、張口度）及自填式問卷（自覺慢性疼痛、自覺下顎張口受限）。
研究結果：本研究共 88 位參與者，女性佔 76.1%。探討張口軌跡與不同狀態下之張口度，發現張口軌跡與「會痛且無輔助張口」、「會痛且輔助張口」之張口度是否達≧ 40mm 皆達顯著性相關（P<0.05）。以 ANOVA 檢定進行張口軌跡和自覺下顎功能受限影響程度比較，皆無顯著性相關。以皮爾森相關分析探討自覺慢性疼痛和自覺下顎張口受限影響程度之相關性，發現「嘴巴能夠張開到咬下三明治」及「打呵欠」的受限程度皆和自覺慢性疼痛達顯著性相關（P<0.05）。結果在疼痛的狀態下，無法校正偏移的張口軌跡其張口度顯著差於其他兩組，且疼痛與自覺下顎張口活動有關。無論是否有輔助的情況下疼痛影響張口度顯著，進而影響下顎活動能力。

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針灸減緩顳顎關節障礙症候群之疼痛

Acupuncture alleviate pain of temporomandibular disorder

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顳顎關節障礙症候群之疼痛通常以止痛藥與咬合板來緩解。本案例為 23 歲女性，關節彈響與張口度受限已經困擾她多年；自述有緊咬之習慣，並且生活壓力大。在他院受物理治療後仍無法改善張口度至可印模製作咬合板，因而於五年前至本院中醫部求診。理學檢查有右側側方運動疼痛、嚼肌壓痛與全口齒列不整、咬合不穩定；放射檢查無關節粘連、髁頭變形。診斷為顳顎關節障礙。在接受每星期一次、兩個月之針灸療程後，張口度改善至可製作咬合板，並藉由中醫部針灸、義齒補綴科咬合板偕同治療，維持目前顳顎關節狀態可以正常生活不受干擾。過去研究指出針灸可藉由刺激肌肉層之痛覺神經來達到抑制痛覺之效果；對於肌肉源性顳顎關節症狀之療效，在療程結束一年以後與咬合板無顯著差異。本案例先藉由針灸減緩顳顎關節障礙症狀，隨後牙科的咬合板治療介入，日後持續以針灸來輔助治療，減緩疼痛。針灸可以有效減緩顳顎關節障礙症候群之疼痛。

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AR 訓練系統對第二型糖尿病合併慢性牙周病患者口腔健康知識、態度、生活品質與口腔清潔提升之成效－前驅試驗研究

The effect of AR digital oral care training system in improving oral health knowledge, attitude, OHRQoL and oral hygiene in type 2 diabetes with chronic periodontal disease patients: a pilot study

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擴增實境（AR）是透過視覺和真實觸覺以達到回饋融入的交互式體驗科技，已開始被運用在不同領域作為輔助學習的互動性工具。本研究目的為了解第二型糖尿病合併慢性牙周病患者在 AR 口腔照護訓練系統介入後對口腔知識、態度、行為及口腔清潔之影響成效。研究採隨機對照實驗設計。對象來自醫學中心內分泌新陳代謝科診斷為第二型糖尿病，並轉介到牙科被診斷為慢性牙周病之患者，參與者隨機分配到 AR 組（n=4）、ARHC 組（n=4）和對照組（n=4）。所有的患者都會接受非手術性牙周治療（NSPT）及一般常規口腔衛教（OHI）。AR 組及 ARHC 組皆透過 AR 系統學習貝氏刷牙法及牙間刷清潔技巧。ARHC 組增加了專業衛教諮詢介入。對照組則不給予介入。於前測及 NSPT 後一個月進行後測，資料收集包含自填式問卷、唾液分析及牙菌斑檢查。並使用 K-W 統計方法（Kruskal-Wallis test）比較各組前後測差異。研究結果顯示介入後，AR 組及 ARHC 組相較於對照組在使用牙間刷習慣部分能有所提升。AR 組及 ARHC 組在口腔保健知識後測較前測分別增加 1.5±0.71 分及 6.0±0.00 分，而對照組無分數上的改變。AR 組及 ARHC 組在口腔健康態度後測較前測分別增加 0.0±5.66 分及 3.0±0.00 分。AR 組口腔照護生活品質後測較前測下降 1.5±2.12 分。AR 組牙菌斑殘留比率後測較前測下降 16.4±35.38%。AR 組與 ARHC 組在口腔健康知識、態度、行為、生活品質與牙菌斑清潔皆有提升及良好的改善趨勢。本項前驅研究顯示 AR 口腔照護訓練系統在短期介入下，第二型糖尿病合併慢性牙周病之患者訓練口腔照護有提升趨勢。建議未來可以進一步加入其他客觀指標（如唾液生物標記、血糖監測等），並做長期追蹤，以利進一步驗證 AR 口腔照護訓練系統用於患者口腔衛生教育之成效。

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情境模擬教學提升牙醫學系與口腔衛生學系學生的跨領域團隊合作照護

Improving interprofessional collaborative ability for dental and oral hygiene st

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臨床場域中需要不同健康專業背景的醫療工作者共同合作，為病人提供高品質的照護。而不同健康專業背景的醫療工作者，要能有默契的互相合作是需要學習的，因此，本研究結合牙醫學系與口腔衛生學系之兩系學生，組成口腔照護團隊，共同照護一位模擬化療中乳癌病人牙痛的口腔臨床情境。分別有 29 組共 57 位學生，參與 30 分鐘的口腔臨床情境模擬演練課程，而其中一位牙醫學系學生臨時請假。於課程結束後完成 9 題跨專業能力指標評核的填寫，依據課程前後對跨專業能力之了解程度，分別由 0 分到 10 分了解進行回答。口衛系學生對整體平均支跨專業能力指標的了解程度由 5.7 分提升到 8.3 分，牙醫系學生則是由 6.2 分提升到 8.7 分，兩系學生在課程結束後皆有顯著的提升且具統計學上顯著性差異。由以上結果可知，運用模擬病人的情境模擬教學，能有效提升學生對跨領域團隊合作照護的認知。

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各種處理對多層二氧化鋯斷裂性能之影響

Effects of various aging treatments on the fracture properties of multilayer zirconia

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CAD/CAM 製備的多層二氧化鋯贋復物各層性質不同可能會影響其結構完整性。因此本研究目的為用四點彎曲試驗研究水熱老化、冷熱循環與疲勞處理對多層二氧化鋯斷裂性能的影響。材料選用強度與透度均漸層的市售多層二氧化鋯（4~5 mol% Y2O3），參照 ISO 6782 規範製備使用於四點彎曲試驗的條狀試片（長 20× 寬 4× 高 1.8mm）。試片分成 8 組：控制組（C）、水熱老化組（A）、冷熱循環組（T）、疲勞組（F）、T+A 組、T+F 組、A+F 組以及 T+A+F 組。分析各組的四點彎曲強度、韋伯常數、斷裂面形貌、晶相結構以及斷裂位置。經 one way ANOVA 統計分析彎曲強度結果顯示，A 組（378.47±50.73）、T 組（395.29±58.03）與 F 組（378.04±51.74）之四點彎 曲強度皆顯著高於控制組（298.43±63.63）（$p<0.05$）。經各種老化處理後材料彎曲強度之韋伯常數均些微上升（即材質的均質性及可信賴度提高）。除 A 處理相關組別（包括 A、T+A、A+F 及 T+A+F 組）發生些微相轉變（四方晶相一單斜晶相），其餘組別無顯著相轉變發生。斷裂位置偏向透明度較高的層區（約 34.78%）。研究結果顯示老化處理可提升多層二氧化鋯之彎曲強度及韋伯常數（即均質性／可信賴性）。

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體驗、反思與臨床推理之多元教學策略於口腔內科學之運用

Using multiple teaching strategies to improve the teaching quality and learning effectiveness of oral medicine

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觀察實習牙醫學生常無法順利運用知識對癌症患者做出合宜的口腔治療計畫，對病人治療過程與辛苦，理解也僅限於書本文字。故本研究以牙五學生為對象，採行動研究法，以多元創新之教學方式，包括本科及跨域職場的見習、實作體驗與反思，案例討論與教師、同儕多元回饋等，實現教學現場翻轉，以達到彌合課堂與臨床差距之目的。結果發現，學生認為分組討論臨床治療計畫後，互相挑戰提問回饋的方式，最有收穫（81.8%）；最喜歡的教學活動是塗氟體驗（77.3%）、跨域職場體驗（68.2%）；病房照會服務的職場見習和塗氟體驗，較能引發學生的同理及學習知識的融入（72.7%）。學生認為本課程有助於提高臨床的邏輯思考（90.9%）、增廣見識（90.9%）、同理病人感受（72.7%）與反思能力（59.1%）。結論：1. 改變教學方式能提高學習興趣，課程內容能吸引較多選修學生。2. 雖然改變教學方式並未有助於提高學期成績，但改變後的評量方式較多元，可能更為客觀，仍需長期觀察。3. 高年級牙醫學生認為案例討論和教師回饋對於提升臨床能力最有幫助，且相對於同理心，高年級學生更重視專業能力的提升，反思與同理應在低年級紮根。

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後疫情下醫療與法律之變革　醫療事故預防及爭議處理法

Changes in Medicine and Law in the Post-Pandemic Era: Medical Malpractice Prevention and Dispute Resolution Act

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面臨後疫情不均衡復甦，牙科醫療爭議調處案件漸增，口腔醫療複雜性及特殊性，加以其「可近性」（較近距離接觸）稍有不慎，更易引起爭議，本報告盼藉由了解相關法律變動，從而保障醫病雙方權益。去年（2022）5 月 30 日甫通過，6 月 22 日總統華總一義字第 11100052431 號令正式公布之「醫療事故預防及爭議處理法」全文共 45 條具三大重點：

1. 溝通關懷
2. 爭議調解
3. 預防除錯但萬一調解不成立後進入訴訟，將針對證據能力及證據力加以闡述，法條雖敘明“不得作為證據”，是否即無證據能力？有無可能使之復活？或影響心證？並對調解之核心如何撰寫評析予以介紹加以討論，除可避免因不知而觸法，更盼能化解爭議，落實理念與實務合一，促進醫病關係和諧，融合具更多爆發力的智能，發揮法之功效，達到保護病人也保護自己的目的。