Efficacy of focal muscular vibration in the treatment of upper limb spasticity in subjects with stroke outcomes: randomized controlled trial

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Focal muscular vibration (FMV) is a non-invasive technique that showed positive effects on spasticity of the upper limb in stroke subjects but different protocols have been proposed so the studies are not comparable and, to date, it is not clear which muscles should be treated, agonist, or antagonist muscles to obtain the better result on spasticity. The objective of this study is to evaluate the effects on spasticity of FMV on the upper limb flexor spastic muscles compared to the effects of FMV on the upper limb extensor muscles in subacute stroke patients. We treated 28 subacute stroke patients (mean age 64.28±13.79) randomized into two groups: Group A and Group B. Group A was treated by applying FMV to the flexor muscles of the upper limb, while Group B was treated by applying FMV to the extensor muscles of the upper limb. The effects on spasticity were assessed by Modified Ashworth Scale (primary outcome) and the upper limb motor function by instrumental robotic outcomes; moreover, muscle strength and pain were evaluated using Motricity Index and Numerical Rating Scale, respectively (secondary outcomes). Patients were subjected to FMV for three consecutive days and were evaluated three times: before treatment (T0), after a week (T1) and after a month (T2) from the end of treatment. Within group, analysis showed statistically significant changes over time of the MAS at the three joints (shoulder, elbow and wrist) in both groups, but post-hoc analysis showed that, only in Group A, MAS was significantly lower at T2, when compared with T0 at the shoulder and elbow. NRS, significantly changed over time only in the Group B. Motricity Index, did not change over time neither in the Group A, nor in the Group B. No statistically significant differences were detected in the between group analysis. Regarding the instrumental robotic outcomes, we detected a statistically significant reduction of the time required to complete the task (Duration) in both group a T2. In conclusion, this study highlighted how the same treatment protocol can determine an improvement in muscle tone and in the Duration to perform a task, regardless of the muscles treated, while the pain improves if we treat the agonist muscles.
Robotic treatment of the upper limb in chronic stroke and cerebral neuroplasticity: a systematic review


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Stroke is the second cause of mortality and the third cause of long-term disability worldwide. Deficits in upper limb (UL) capacity persist at 6 months post-stroke in 30-66% of hemiplegic stroke patients with major limitations in activity of daily living (ADL), thus making the recovery of paretic UL function the main rehabilitation goal. Robotic rehabilitation plays a crucial role since it allows to perform a repetitive, intensive, and task-oriented treatment, adaptable to the patients’ residual abilities, necessary to facilitate recovery and the rehabilitation of the paretic UL. It has been proposed that robot-mediated training may amplify neuroplasticity by providing a major interaction of proprioceptive and/or other sensory inputs with motor outputs, with significant modifications in functional connectivity (coherence) within the fronto-parietal networks (inter- and intra-hemispheric functional connectivity) related to processes of movement preparation and execution. However, the neurophysiological mechanisms underlying this reorganization are not entirely clear yet. Therefore, the aim of this study is to revise the literature, which assesses the effect of robotic treatment in the recovery of UL deficits measured in terms of neuroplasticity in patients affected by chronic stroke. This systematic review was conducted using PubMed, PEDro, Cinahl (EBSCoHost), Scopus and Cochrane databases. The research was carried out until February 2020 it included articles written in English language, published between 2009 and 2020, and the outcomes considered were neuroplasticity assessments. We included 23 studies over 6145 records identified from the preliminary research. The selected studies proposed different methods for neuroplasticity assessment (i.e. transcranial direct current stimulation (tDCS), EEG-Based Brain Computer Interface (BCI) and Neuroimaging (fMRI)), and different Robotic Rehabilitation treatments. These studies demonstrated a positive correlation between changes in central nervous circuits and post-treatment clinical outcomes. Our study has highlighted the effectiveness of robotic therapy in promoting mechanisms that facilitate re-learning and motor recovery in patients with post-stroke chronic disabilities. However, future studies should overcome the limitations of heterogeneity found in the current literature, by proposing a greater number of high-level RCTs, to better understand the mechanisms of robot-induced neuroplasticity, follow the clinical progress, estimate a prognosis of recovery of motor function, and plan a personalized rehabilitative programme for the patients.
Hand motion analysis during robot-aided rehabilitation in chronic stroke

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A high percentage of post-stroke patients reports spasticity and no functional use of the upper limb. To adapt the therapy in the most patient-specific manner, it is of paramount importance to objectively assess motor improvement during rehabilitation therapy. In this paper, a quantitative evaluation of the results obtained by using a commercial exoskeletal glove for hand rehabilitation (i.e. Gloreha Sinfonia®) is performed. A camera-based calibration procedure for the bending sensors embedded in the Gloreha Sinfonia robotic glove for hand rehabilitation is introduced to retrieve the range of motion (i.e. the flexion angle excursion of the finger metacarpophalangeal joints) of the patients’ hand. Once calibrated, the sensors embedded in the glove have been used to objectively assess the motor performance of chronic post-stroke patients that underwent a robotic treatment with the Gloreha Sinfonia glove. The preliminary results obtained on ten post-stroke patients demonstrated i) that the camera-based procedure permits to retrieve joints’ angular values from bending sensors embedded in the glove ii) an improvement in motor performance.
Sensorized assessment of bilateral hand movements in patients with stroke driven by rhythmic auditory or visual-auditory stimulation

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There is a growing body of literature about the efficacy in neurorehabilitation of the devices providing rhythmic auditory stimulations or visual-auditory stimulations, such as videogames, for guiding the patients’ movements. Despite being presented as tools able to motivate patients, their efficacy was not been proven yet, probably due to the limited knowledge about the factors influencing the capability of patients to move the upper limbs following an external stimulus. In this study, we used a marker less system based on two infrared sensors to assess the kinematics of up and down in-phase and anti-phase bilateral hand oscillations synchronized or not with an external stimulus. A group of stroke survivors, one of age-matched healthy subjects and one of young healthy subjects were tested in three conditions: no stimulus, auditory stimulus, and video-auditory stimulus. Our results showed significant negative effects of visual-auditory stimulus in the frequency of movements (p = 0.001), and of auditory stimulus in their fluidity (p = 0.013). These results are conceivably related to the attentional overload required during the execution of bilateral movements driven by an external stimulus. However, a positive effect of external stimulus was found in increasing the range of movements of the less functional hand in all subjects (p = 0.023). These findings highlight as the type of stimulus may play a crucial role in the patient’s performance with respect to movements that are not-externally driven.
Antimicrobial efficacy of photodynamic therapy (PDT) in periodontitis and peri-implantitis: A systematic review.

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To systematically review the literature regarding the antimicrobial effects of photodynamic therapy (PDT) on multi-bacterial species in periodontitis and peri-implantitis disease. The addressed focused question was: “Does PDT show antimicrobial efficacy against multi-bacterial species colonization in periodontal pockets and on the surface of dental implants?” Electronic databases including MEDLINE and EMBASE up to and including December 2018 were searched. Of the ninety studied analyzed, seven were included, four for the study of PDT in peri-implantitis disease and three for periodontal disease. All studies reported the multibacterial species outcomes after the application of antimicrobial PDT. All studies showed a significant reduction in the bacterial load, both in studies based on periodontal and peri-implantary disease, with an average reduction of the total amount of bacterial load of 99.3%. Moreover, the change in clinical parameters is equally important, with an average reduction of PPD of 1.01 mm (from 4.92 to 3.49 ± SD with a percentage reduction of 29%); of BoP of 50%; of RCAL of 1.19 mm (from 9.93 to 8.74, with an average percentage reduction of 12%); of PI of 0.3 (from 1 to 0.7 with a percentage reduction of 30%) and of GI of 1.2 (from 1.8 to 0.6 with a percentage reduction of 66.6%). This review demonstrated significant reduction in the bacterial load in periodontal pocket and dental implant surface with the use of PDT. The results of this review should be considered preliminary and further studies with standardized laser parameters are needed to obtain strong conclusions.
Photodynamic therapy (PDT) in non-surgical treatment of periodontitis

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Periodontitis represents a major problem for patients, since it is not possible to eliminate the bacteria that are responsible for this pathology with a pharmacological treatment. The present study included forty-four patients with periodontitis, who had undergone disinfection via photodynamic therapy (PDT) using a laser source having a 635 nm wavelength associated with a photoactivable substance (methylene blue). Clinical assessment of plaque index (PI), bleeding on probing (BOP), probing depth (PD), calculus index (CI), gingival recession (REC) and clinical attachment level (CAL) were recorded at base line, 1 month (4 weeks) after treatment and again 3 months (12 weeks) after treatment, while site radiography (RX) and microbiological test (MT) were recorded at base line and 3 months (12 weeks) after treatment. The outcomes show a good efficacy of the PDT in the elimination of the periodontal pathogenic microflora and in the improvement of the clinical parameters considered: from the base line to the final check after 12 weeks it has been observed a reduction in REC of about 16.9%, a reduction of CAL of about 17.85%, a reduction of the BoP of about 93.3%, a reduction of the PD of about 17%, a reduction of the CI of about 66.3%, a reduction of PI of about 44%, and microbiologically a reduction of the total amount of bacteria with proven parodontopathic properties (red complex bacteria) of about 58.74%. Within the limits of the present study, PDT can be reasonably considered as a good carrier that leads to significant improvements in the parameters (clinical and microbiological) considered.
Robotic hand treatment of patients affected by chronic stroke: a monocentric longitudinal pilot study

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Few studies investigated the effects of a robotic treatment in hand motor recovery after stroke. Aim of the present study was to evaluate the efficacy of treatment by means of Gloreha Sinfonia® robotic glove in hand motor recovery of a chronic stroke sample of patients with different impairment severity. Thirteen chronic stroke subjects were assigned to either active-assisted robotic treatment or passive robotic treatment according to their ability to actively extend wrist for at least 20 degrees. All subjects underwent 20 sessions of treatment with Gloreha Sinfonia® and were evaluated before (T0), after treatment (T1) and after one month (T2) with clinical scales testing motor performance [Motor Power (MP); Fugl Meyer Upper-Extremity (FMUE)] and spasticity [Modified Ashworth Scale (MAS)]. Both groups showed significant motor recovery and spasticity reduction. Further randomized controlled trials with larger samples are needed to confirm our results.
Use of wearable systems for the detection of chest-abdominal wall movement aimed at respiratory monitoring in sport: a scoping review on available data

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There is a significant request for wearable systems for vital signs and athletic performance monitoring during sport practice, both in professional and non-professional fields. Respiratory rate is a rather neglected parameter in this field, but several studies show that it is a strong marker of physical exertion. The aim of the present scoping review is to evaluate the number and kind of existing studies on wearable technologies for the analysis of the chest wall movement for respiratory monitoring in sport and fitness. The review included studies investigating the use of contact-based wearable techniques for the detection of chest wall movement for respiratory monitoring during professional or amateur sport, during fitness and physical activity. The search was conducted on PubMed/Medline, Scopus and Google Scholar electronic databases using keywords. Data extracted were entered into a Microsoft Excel spreadsheet by the leading author and then double-checked by the second author. A total of 25 descriptive studies met the inclusion criteria. Few studies on small number of athletes were found, technologies were often evaluated without a reference system, data on participants are sometimes missing. To date, we are not able to draw conclusions on which is the best and most reliable device to use during sport practice.
Non-implantable bone conduction device for hearing loss: a systematic review

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There are different treatment options that employ a bone conduction transmission of the sound, for different types of hearing loss, as well as hearing aids, medical intervention via prostheses and surgically implanted medical devices. A middle ear disease causes a decline in the conductive mechanism of hearing. The current possibilities of compensating Conductive Hearing Loss (CHL) solutions include both surgical and no surgical Bone Conduction Devices (BCDs). Due to the invasiveness of the implantable devices and their specific requirements in terms of the temporal bone anatomy, non-implantable BCDs are in some cases preferred in the clinical routine. The goal of this review is to investigate the beneficial effects and safety of non-implantable BC devices, analysing the different type of solutions found so far. A systematic review was performed to identify all the clinical studies evaluating the use of non-invasive BCDs. A qualitative analysis based on data extracted was conducted. From 37 articles, 11 prospective studies and 1 retrospective study were selected for a full analysis, for a total of 173 patients from 4- to 77-years-old. Eight of these studies included adult patients, while the other four are paediatric studies. All the studies analyse non-implantable BCDs commonly used in case of CHL, sensorineural HL and single side deafness. Three of them analyse an adhesive device, six compare the adhesive device with a sound processor mounted on a support fitted on the head, one compare it also with an implant, one analyse the sound processor mounted on different type of support, and one compare different type of sound processor. All the studies showed advantages from the use of non-invasive BCDs, both on adults and children. The non-invasive BCDs analysed in this review show good results both from the audiological and subjective point of view and could be considered a safe and effective solution for patients suffering from conductive hearing loss, sensorineural hearing loss or single-side deafness. More studies are required to confirm these promising results.
Evaluation of the periodontal healing of the second mandibular molar distal site following insertion of PRF in the third molar post extraction alveolus

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The aim of this study was to evaluate the periodontal healing of the distal sites of the mandibular second molars, comparing the extraction therapy of the third molar with and without PRF adjunct into the post-extraction alveolus. The study sample was composed by 40 consecutive patients who underwent extraction of mandibular third molars. Patients were divided in two groups: the last 20 participants who have only been subjected to extraction (spontaneous healing group, SHG) and the first 20 patients who had PRF adjunct (PRF group, PG). Healing was evaluated by analyzing the variations in terms of PPD (Probing Pocket Depth), REC (Recession), CAL (Level of Clinical Attachment), BoP (Bleeding on Probing) and GI (Gingival Index) from Baseline to further follow-ups at 1 month and 3 months. The disto-vestibular (DV) and disto-lingual (DL) PPD values of the second mandibular molar were measured at Baseline and after three months in the two groups. Patients of the PG group showed lower PPD values at 1 month and 3 months postoperatively: DV: 3.6±1.09 - DL: 3.5±1.15 and DV: 2.5±0.83 - DL: 2.6±1.09, respectively. Patients belonging to the SHG also showed lower PPD values, reporting respectively the following DV values after 3 months: 2.7±0.86 - DL: 2.75±0.85. However, there was no statistically significant difference comparing the results obtained in PG and SHG groups at 1 and 3 months (p>0.05). The insertion of PRF inside the post-extraction alveolus of the mandibular third molar leads to limited improvement in terms of periodontal healing, compared to extraction therapy only.
Teaching parotid surgery to ENT residents in the era of new technologies: an ex-vivo ovine model

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Surgical training has recently assumed a central role in the otolaryngology field, and the necessity to train residents and fellows’ skills in a progressive manner has led to an incredible widespread of ex-vivo animal models for several surgical procedures. To report our experience with an ex-vivo ovine model for parotid gland dissection in a training context. A junior resident (PGY-1) and a post-graduate student with no experience in parotid surgery were guided by a skilled surgeon in the parotid gland dissection for each step of the procedure. Three different adult lamb heads were used for this feasibility study. A specific preparation of the model was performed before the training session. Similarity between the ovine model and the human were recorded. The resident and the post-graduate student were able to carry out a complete parotid gland dissection under supervision. The correct identification of surgical landmarks has led to a proper surgical simulation. The facial nerve dissection was adequately performed, and all branches were isolated. Parotid surgery training on an ex-vivo ovine model is useful, easy repeatable, and low cost. The ovine model presented in this study has similarities in size, structure, and tissue consistence to the human parotid, making it an ideal model for residents to simulate parotid surgery.
The efficacy of Barbed Sutures for Anterior Pharyngoplasty: technical aspects and preliminary results

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After the first experiences with the Barbed Sutures (BS) in sleep surgery, we present the Modular Barbed Anterior Pharyngoplasty (M.B.A.Ph.), a functional tenso-structural reconstruction of the soft palate, as a surgical solution for Obstructive Sleep Apnea (OSA) due to antero-posterior collapse at the drug induced sleep endoscopy (DISE) for snoring and mild-moderate OSA. The action of the BS is sustained over time by means of solid and stable tissue scarring. M.B.A.Ph. avoids palatal fibromuscular resection and minimize iatrogenic bleeding (bloodless surgery). The technique is described in detail and some preliminary results are presented.
Intraneural electrical stimulation of median nerve: a simulation study on sensory and motor fascicles

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Neuroprostheses can be an innovative solution to improve quality of life of upper limb amputees. In this framework, the recovery of sensory feedback is a property widely requested by amputee subjects. Neural prostheses are based on neural interfaces that allow delivering direct current stimuli to the nerve fibers. The study of the interaction between the nerve and the electrode is fundamental to investigate activation properties in the nerve. Furthermore, the results could provide useful insight into improve the design of the electrodes and to advance and ameliorate tactile sensations, elicited by these interfaces, obtaining tactile feedback more like natural sensations. This work aims at studying, by means of a FEM Neuron computational model, the axon fibers activation by means of neural stimulation provided through the intraneural electrodes DS-file. Three different types of stimulation waveforms (i.e. biphasic charge balanced stimulus with inter-pulse delay, biphasic charge balanced stimulus without inter-pulse delay, biphasic charge unbalanced stimulus with inter-pulse delay), three different nerve fascicles, i.e. two sensory and one motor fascicle, and ten distances from the electrode in the fascicles, are considered. The efficacy of the stimulation expressed as the percentage of activation of the fibers, and the safety, in terms of current intensity and used waveform, are studied in the previously described different conditions and the results are compared. The obtained results show that: i. stimulating a sensory fascicle with implanted active sites can activate a fascicle close to it, but not all the fascicles belonging to the same nerve. In fact, in the nerve considered in this study, a motor fascicle cannot be activated due to the values of the electrical potential which are too low to activate the fibers; ii. the current intensity necessary to activate fibers increases according to the distance from the source of the stimulus; iii. by using a biphasic charge unbalanced stimulus, the threshold to activate the fibers is lower than using the other tested waveforms. It is an important result because the stimulation is efficient and safer since current intensity is lower than the one used for the other two waveforms.
New methods and tools to assess nutritive sucking in new-borns: effect of different feeding bottles on nutritive performance

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Nutritive sucking is a fundamental process assuring the primary infant nourishment in the first months of life. When feeding is impaired for pathological conditions, the growth of the infant may be delayed with a cascade effect on the overall development. While literature studied nutritive sucking development in infants with feeding problems, like in severe premature babies or with low weight at birth, few works assesses to what extent different feeding bottles may influence feeding performance of healthy new-borns. This work proposes a method for functional characterization of feeding bottles based on the most promising and reliable indices used to quantitatively assess feeding skills in clinical applications. Thirty healthy new-borns have been fed with two different bottles instrumented with a device for feeding monitoring. Their impact on feeding performance is objectively assessed and discussed. The approach presented here, even if preliminary, paves the way to a new method for functional characterization of feeding bottles. Further studies may allow to confirm our analyses with a higher number of bottles and infants.
Gait training with Achilles ankle exoskeleton in chronic incomplete spinal cord injury subjects

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Powered exoskeletons (EXOs) have emerged as potential devices for Spinal Cord Injury (SCI) to support the intervention of physical therapists during therapy (rehabilitation EXOs) as well as to assist lower limb motion during the daily life (assistive EXOs). Although the ankle is considered a key joint for gait restoration after SCI, very few ankle exoskeletons were developed and tested in incomplete SCI (iSCI) population. Among those, the Achilles ankle exoskeleton is the only one embedding a Controller inspired by the neuromuscular system (NeuroMuscular Controller, NMC). In a previous study we demonstrated that a period dedicated to train iSCI subjects in using the Achilles EXO as an assistive aid, improved robot-aided walking speed and surprisingly also generated a positive trend in free walking speed on long and short distances thus suggesting a possible unexpected rehabilitation effect. To further investigate this result, a case-control longitudinal study was conducted in the present work. The aim of this study was to test the hypothesis that Achilles-aided training could improve performance of free walking of chronic iSCI people more than conventional intensity-matched gait rehabilitation. Before and after conventional and robot-aided rehabilitation a number of variables were analyzed, including spatiotemporal parameters, joint kinematics, ground reaction forces, muscle force, spasticity and its related symptoms, balance and personal experience about the training. Results showed that only the NMC-controlled Achilles training allowed participants to significantly walk faster, with a longer step length and a reduced gait cycle time. A slight force and spasticity improvements were also experienced. In terms of subjects’ personal experience, Achilles training was perceived more interesting and less physically demanding than conventional rehabilitation.
Effectiveness of a sensor-based technology in upper limb motor recovery in post-acute stroke neurorehabilitation: a randomized controlled trial

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Sensor-based technological therapy devices could be a possible neurorehabilitation strategy for motor rehabilitation in patients with stroke during the post-acute hospitalization, especially for treating upper extremities function limitations. The audio-visual feedback devices are characterized by interactive therapy games that allow training the movement of shoulders, elbows, and wrist, measuring the strength and the active range of motion of upper limb, registering data in an electronic database to quantitatively monitoring measures and therapy progress. This study aimed to investigate the effects of sensor-based motor rehabilitation in add-on to the conventional neurorehabilitation for improving the upper limb functions in patients with subacute stroke. Thirty-seven patients were enrolled in the study and randomly assigned to the experimental group and the control group. The training consisting of twelve sessions of upper limb training compared with twelve sessions of upper limb sensory-motor training, without robotic support. Both rehabilitation programs were performed for 40 minutes three times a week, for 4 weeks, in addition to conventional therapy. All patients were evaluated at the baseline (T0) and after 4 weeks of training (T1). The within-subject analysis showed a statistically significant improvement in both groups in all clinical scales. The analysis of effectiveness revealed that, compared with baseline (T0), the improvement percentage in the Modified Barthel Index was greater in the experimental group than the control group. The use of a sensor-based training with audio-video-feedback could be a useful complementary strategy for improving upper limb motor functions in patients with stroke during post-acute neurorehabilitation
Clinical and functional outcomes of cad/cam mandibular reconstruction with free fibular flap comparing traditional versus micro-invasive intraoral surgical approaches

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The surgical incision plays a pivotal role in any surgical procedure. A good surgical approach should allow optimal visualization, respect the anatomy and ensure the best aesthetic outcome possible, especially when the lesions involve the face. In this retrospective study, carried out from June 2014 to April 2018, different types of surgical approaches to perform mandibular reconstruction were compared. Twenty-one patients who underwent mandibular reconstruction with free fibular flap (FFFs) using CAD-CAM technology and Virtual Surgical Planning (VSP) were included in the study, regardless the condition, the timing of reconstruction (primary vs secondary), the number of fibular segments or the type and size of the mandibular defect. The patients were treated for mandibular defects secondary to benign or low-grade oncological lesions and different non-oncological conditions. However, patients requiring neck dissection were excluded from the study. Patients were divided into two groups according to the type of surgical approach used: 7 patients received a traditional transcervical approach together with an intraoral approach, while 14 patients were operated through an intraoral approach combined with different microinvasive approaches, including the sub-mandibular, the retro-mandibular and the pre-auricular approaches. Different factors were statistically compared: characteristics of the harvested fibula, surgical timing, days of hospitalization, as well as complication, functional and aesthetic outcomes. According to this study, no statistically significant differences were observed between the two groups in any of the features considered. These results support the hypothesis that the combination of different microinvasive approaches and the traditional approach are superimposable, and they can be safely exchanged when the underlying defects allow it.
Evaluation of factors influencing accuracy of virtual surgical planning in orthognatic surgery

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Three-dimensional virtual surgical planning has become routine practice in orthognatic and reconstructive surgery for the possibility to realize presurgical evaluation of intraoperative bones movements, the prediction of postoperative results and the high level of accuracy. Thanks to surface superimposition between 3D planned and 3D postoperative model of maxillo-facial skeleton, a medium discrepancy less than 1 mm was found in scientific literature, considering 15 different points of maxillofacial skeleton. In our study we decided to evaluate different factors that could invalidate that result in the same cohort of patients, such as sex, kind of dentofacial deformity, asymmetry, type of surgical approach and entity of maxillo-mandibular movements (more or less than 1 mm). We found out no significant differences among groups. We can state that virtual surgical planning and 3D surgical splints are a valid means of diagnosis, treatment and predictivity regardless factors that could influence post-operative results. In conclusion, virtual surgical planning and 3D surgical splints facilitated diagnosis, treatment planning and accuracy regardless of sex, dentofacial deformity class, surgery techniques, entity of advancement and asymmetry.
**Epidemiology of odontogenic sinusitis: an old, underestimated disease, even today.**

A narrative literature review

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Odontogenic sinusitis is an inflammatory condition of the paranasal sinuses resulting from dental pathology. The aim of this study is to provide an overview of the current literature on the dimensions of the phenomenon, quality of life, economic considerations, and approaches to odontogenic sinusitis. A narrative review was conducted following the methodology proposed by Green et al. (2006). There appears to have been an increase in the incidence over the last decade. Nowadays, evidence in the literature reports that 10-12% up to 40% of all sinusitis cases are associated with odontogenic infections. The iatrogenia was by far the leading cause of odontogenic sinusitis (55.97%) while the first and second molars were the most affected teeth with an incidence of 35.6% and 22%. If not properly diagnosed and treated, these infections may lead to a rapid spread, giving rise to potentially life-threatening complications with a significant general health-related Quality of Life detriment. The proper management of patients in a pre-implant logical setting leads to substantial savings, ranging from €38 million to €152 million, for the Italian National Health Service. Odontogenic sinusitis management should involve shared decision-making between the otolaryngologist, dental provider, and patient, where the benefits and risks of dental treatment and endoscopic sinus surgery are discussed.
Time course of the upper limb motor recovery in subacute stroke patients undergoing conventional or robotic rehabilitation. A preliminary report

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Upper limb recovery is a complex process and a strong challenge in the rehabilitation of patients after stroke. Several studies have been conducted to compare the efficacy of conventional and robotic rehabilitation to restore the upper limb motor impairment following a stroke. However, the evolution of the upper limb motor ability during an intervention, as well as the time point when the patient stops improving (the so call plateau), are rarely measured, and never compared between the two approaches. These latter aspects are very important considering the need for an optimization of the economic resources. In this study, the time course of the upper limb motor recovery of 24 subacute stroke patients undergoing a 30-session robotic or conventional treatment was analyzed through the upper extremity portion of the Fugl-Meyer Assessment scale (FMA-UE). The FMA-UE was administered before the treatment, and after 10, 20, and 30 rehabilitation sessions. Statistical analysis showed that, according to the FMA-UE, the time course in the two groups was similar: patients did not change between the baseline and the 10-session assessment, while they improved between 10 and 20 sessions, and between 20 and 30 sessions, with most of the gain observed between 10 and 20 sessions. This result suggests that 30-session robotic or conventional rehabilitation programs induce a similar curve trend in the upper limb motor recovery of patients with subacute stroke, with an important increase in the middle of the program and without reaching a clear plateau in the analyzed time interval.