Pharmacotherapy in orthodontic treatment supported by micro-implants

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Abstract:
In modern orthodontics, micro-implants are essential for anchorage reinforcement, crucial for treatment time shortening and elimination of undesired side-effects. Nonetheless, placement of a micro-screw involves unavoidable tissue discontinuity, therefore, the aim of work was an attempt to establish rules of pharmacotherapy in micro-implantation. Neither pain nor inflammation developed after screwing 90 micro-implants in, thus, efficiency of infiltration anesthesia with typical analgesics was confirmed; there was also no need to administer non-steroidal anti-inflammatory medicines with analgesic/anti-inflammatory activity. Concluding, micro-implantation is an intervention of low invasiveness, requiring no special pharmacotherapy, although it may be demanded in certain individual cases.

Key words: pharmacotherapy, orthodontics, micro-implants

Introduction

Micro-implants are one of current treatment modalities reinforcing anchorage in orthodontics, which apparently either shortens treatment time: teeth move as one unit or decrease root-resorption risk – dental jiggling is eliminated [2, 3, 6]. Micro-implants require: infiltrative anesthesia, vertical incision, and drilling of canal in alveolar process. These procedures, together with micro-implants screwing in and out are potential risk factors, that may lead, due to tissue-discontinuity, to infection, mechanical and thermic damage, inflammation and tissue swelling [13]. Frequency and character of these side-effects have not been evaluated in Poland. Nonetheless, in some countries, antibiotic prophylaxis is legally imperative [15].

The aim of work was an attempt to establish rules of pharmacotherapy in micro-implantation for orthodontic purposes.

Materials and Methods

Ninety conical micro-implants, 1.3 to 1.2 in diameter, approximating No. 12 typical injection needle, were implanted in 30 patients, with no antibiotic preceding or

Fig. 1. Range of vertical incision
proceeding surgical procedures. 2% lignocaine with noradrenaline was utilized for infiltration anesthesia. Sites of implantation were planned according to anatomical limitations and biomechanical requirements of treatment [10, 11]. Vertical incision (4–5 mm) made through the soft tissue (Fig. 1) was followed by indentation (with a round bur 0.9 mm) in the cortical bone surface. This indentation prevented a pilot drill (diameter 1.0 mm) from slippage while drilling the oblique tunnels (Fig. 2A,B) where all micro-implants were self-tapped with hand-screwdriver (Fig. 3). In local analgesia with 2% arycaine (6 cases) or 2% lignocaine with noradrenaline (5 cases) 11 micro-implants were removed (Fig. 4) once orthodontic treatment had been finished.

Results and Discussion

In the presented studies, clinicians referred to a reasonable antibiotic therapy. An antibiotic was applied to control a possible microbial infection. It might have been the initial diagnosis, but conceivable decision and antibiotic selection had to based on data concerning potential disease process [5].

All micro-implants were designed as self-drilling ones, but self-tapping method was claimed to be less invasive in terms of overpressure or oral mucosa forcing into the prepared tunnel [4, 12]. Despite self-tapping 7 micro-implants were rejected, however, none of 30 patients called for antibiotics, which demonstrated compliance with basic rules of aseptics efficiently preventing infection. However, the improbable incident of infection with species resistant to many antibiotics, might have been countered by 1-methyl-N’-(hydroxymethyl)nicotinamide reported recently as a non-toxic drug with remarkable anti-inflammatory and anti-bacterial protective properties, due to formaldehyde-slow release diminishing its irritative properties and pungency [1].

Efficiency of infiltration anesthesia with typical analgesics was also reconfirmed, since none of the indi-
Individuals reported pain accompanying surgical procedures and screwing micro-implants in [13]. Apparently increased sensibility threshold in the patient with Cornelia de Lange I syndrome enabled to screw micro-implant off without analgesia. Although the presented patients required no non-steroidal anti-inflammatory medicines with analgesic/anti-inflammatory activity [8], one had to consider their eventual administration. Current report upon coxibs, cyclooxygenase-2 inhibitors, sounds promising in terms of antipyretic and antianalgesic actions without serious gastrointestinal adverse effects. Although the use of these drugs has to be under certain scrutiny, due to thromboembolic events, etoricoxib is very efficient as a post-operative dental pain-killer in cardiovascular low risk population [14].

Micro-implantation is an intervention of low invasiveness [7, 9]. Basically, it requires no antibiotic prophylaxis, no special sort of local anesthesia and no non-steroidal anti-inflammatory medicines. Risk and type of possible undesired side effects do not vary from these observed after typical injections accomplished with classic needles. Nevertheless, it must not be ruled out that single cases may demand different treatment with individualized pharmacotherapy.

References:


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