Drug Review

Periochip

Col VB Mandlik*, Lt Col AK Jha+

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Key Words : Local drug delivery; Chlorhexidine

Introduction

Recently a new approach using local delivery systems containing antimicrobial has been introduced to treat periodontal diseases. There are distinct phases in a periodontal treatment plan where a dental practitioner can use this sustained release device

1. As an adjunct to scaling and rootplaning
2. Periodontal maintenance therapy : Recurrent periodontitis usually involves only a few teeth, where the usage of this device is ideal.
3. For whom surgery is not an option or those who refuse surgical treatment.
4. Sustained release device is a less invasive treatment option and it requires less time as compared to surgical treatment.

Periochip

Periochip, the controlled subgingival delivery of chlorhexidine, was developed by Perio Products Ltd, Jerusalem, Israel and it is the only product available commercially. This is a 5 x 4 x 0.3 mm film containing 2.5 mg of chlorhexidine gluconate which is incorporated in a biodegradable matrix of hydrolyzed gelatine cross linked with glutaraldehyde. The matrix also contains glycerin and purified water. It was first introduced in United States in 1998. Room temperature periochip, with the added benefit of easy storage and ease of use was introduced in 2002. It comes in boxes of 10 chips, the shelf life of which is two years. Each chip is individually packed in a separate aluminium blister pack.

Chlorhexidine has been shown to be an effective agent in plaque inhibition because it is well retained in the oral cavity, reacting reversibly with receptors in the mouth due to its affinity for hydroxyapetite and acidic salivary protein. Twice daily rinse with 10 ml of a 0.2% aqueous solution of chlorhexidine digluconate almost completely inhibited the development of plaque, calculus and gingivitis in the human model for experimental gingivitis.

Mechanism of action

The bactericidal effect of the drug is due to the cationic molecule binding to extra microbial complex and negatively charged microbial cell walls, thereby altering the osmotic equilibrium of cells. It inhibits plaque formation by binding to anionic acid groups on salivary glycoproteins thus reducing pellicle formation and plaque colonization. It also binds to salivary bacteria thus interfering with their adsorption to teeth.

The drug is poorly absorbed from gastrointestinal tract and 90% of retained drug is excreted in the faeces and remainder via urinary tract.

Adverse effect

Yellow staining of teeth is seen by the formation of iron sulphide (iron which originates from diet and sulphur from exposed thiol groups from denatured proteins). Other adverse effects are dullness of taste sensation and carcinogenicity staining.

Carcinogenecity

Parachloroaniline (PCA) an industrial chemical is found in chlorhexidine products as a trace contaminant. It forms a breakdown product subsequent to prolonged shelf life or exposure to high temperature. Keeping chlorhexidine solution in a dark refrigerated bottle can retard this. Risk assessment associated with chlorhexidine application must be based upon actual applied dosages When the levels of PCA exceed 20 mg/litre of urine, workers in clinical plants should be referred for medical treatment.

Importance of Chlorhexidine Chip in Periodontal Therapy

If the progression of periodontitis can be arrested by chlorhexidine chip, it can be accepted as a routine strategy. Routinely probing depth of > 4 mm may be an indication for periodontal surgery, which increases morbidity and expense to the patient. Surgery is the only treatment in furcation defects, intrabony defects and

*Associate Professor, + Reader (Department of Dental Surgery), Armed Forces Medical College, Pune 411 040.

deep tortuous pockets. Disadvantage of flap-surgery includes gingival recession leading to tooth elongation, causing sensitivity and esthetic problems. If adjunctive use of sustained release chlorhexidine reduces pocket depth, a second placement of the chip should be considered where pocket depth remains >5 mm.

Procedure

Tooth with probing pocket depth of >5 mm are selected for the placement of chip. After thorough scaling and root planing, the area is dried and chip is inserted into periodontal pocket with tweezers. After placement of the chip, the area is protected with periodontal pack. Patients are asked to refrain from brushing and flossing the area for seven days. After seven days, they are recalled for pack removal and evaluated for any inflammatory response.

Conclusion

The chip is a new armamentarium that can be easily incorporated into the artillery of a dental practitioner for the management of chronic periodontitis. This also prevents periodontal morbidity and subsequent problems like loss of tooth, periodontal abscess, tooth mobility and pain. As a monotherapy, local drug delivery systems incorporating a variety of drugs can improve periodontal health. Chlorhexidine chip is a new apparently cost effective treatment option for non surgical periodontal therapy. Adjunctive use of chlorhexidine chip could reduce periodontal surgical needs significantly at little or no additional cost.

Conflicts of Interest

None identified

References

1. Kornman KS. Controlled release local delivery- Antimicrobials in Periodontics. Prospects for the future - JP 1993; 64: 782-91.
2. Controlled drug release in Periodontics. A review of new therapies. BDJ 1991; 170: 405-7.

Radiological Quiz

Lt Col AN Prasad*

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A young second gravida woman was detected antenatally (at 36 weeks) as having intracranial cyst in left cerebral cortex of the foetus, on abdominal ultrasonography. The baby (term female twin 2 neonate) was born out of spontaneous vaginal twin delivery. Post natal period was uneventful and the baby was started on breast feeds. At birth, external clinical examination was normal. Magnetic resonance imaging (MRI) of the brain was done on fourth day of life (Fig. 1).

What is the diagnosis?

Answer to the quiz : pg 370

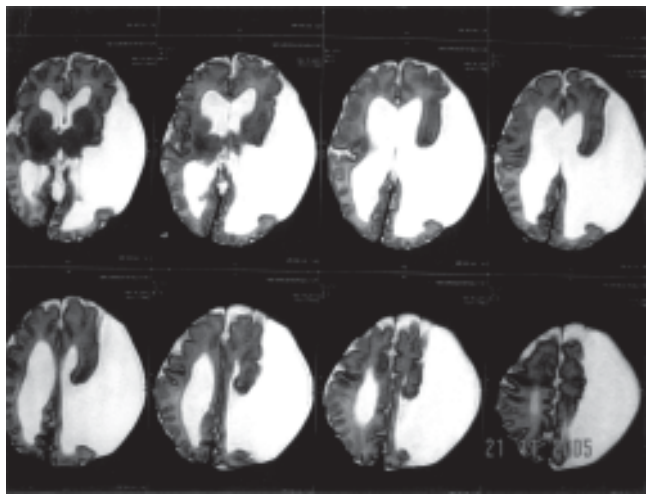

Fig. 1 :

*Classified Specialist (Paediarics), 166 Military Hospital, C/o 56 APO. Received : 31.01.2006; Accepted : 24.05.2007