

EFFECTS OF AYURVEDIC MEDICINES IN THE HEALING AND CONTROL OF INFECTION IN JAW FRACTURES

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ABSTRACT

Introduction-*Septilin* plus *Geriforte* herbal drugs in combination with antibiotics promote healing of fractures and control infection, which are compounded into the mouth or skin, without attendant complications. **Methods-** Hundred patients of varying age and sex, having jaw fractures were included in this study. 50 patients received only antibiotics and the remaining 50, antibiotic plus *Septilin* and *Geriforte* combination. **Results-***Septilin* is useful in cases of middle one-third fractures where there are chances of infection of the maxillary sinus. Post-fracture complications were reduced with *Septilin* plus *Geriforte* and antibiotic. *Septilin* and *Geriforte* combination can be continued till the period of immobilization without fear of any untoward reaction. **Conclusion-***Septilin* plus *Geriforte* combine the efficacy of an antibiotic and safety of a non-antibiotic, thus controlling the residual infection and helps in faster healing of jaw fractures.

Keywords- Inflammation, Complication, Antioxidant, Sinus

INTRODUCTION

The healing of fractured or injured bone depends upon a variety of complex processes acting to restore the integrity of the skeletal tissues and return the tissue to their normal functional capacity. The process of bone repair and its possible complications was well understood in the time of Hippocrates, who wrote, "If there is no inflammation in twenty days, since callus forms quickly as in other porous bones, unless necrosis supervenes."

Healing of bone occurs rapidly and effectively in normal circumstances. However, complications may occur and healing may be retarded or may not be complete so that bony union of the fractured ends may be affected and a fibrous union results. Infection

is one of the important factors that may retard or lead to incomplete healing. Normally, antibiotics are used to control the infection but they cannot be continued for extended periods because of the production of resistant strains to antibiotics and various systemic complications. *Septilin*, a herbal remedy of the Himalaya Drug Co., can be used for antibacterial therapy without encountering any drug resistance to commonly used antibiotics. It possesses immunomodulatory properties that aid in strengthening the immune system. *Septilin* stimulates phagocytosis by macrophage activation, increases the polymorphonuclear cells and helps overcome infection. *Septilin* builds up resistance to infection and helps to prevent re-infection¹. *Septilin* augments granulocyte-

macrophage differentiation, natural killer cell activity and antibody-dependent cytotoxicity. *Septilin*'s stimulatory effect on the humoral immunity increases the antibody-forming cells, thereby enhancing the secretion of antibodies into the circulation². Guggulu, Conch shell, Guduchi (*Tinospora cordifolia*), Indian gooseberry, Horse-radish tree, Licorice etc. are the main ingredients in *Septilin*. These ayurvedic medicines have miracle power to boost our immune system. *Geriforte*, an indigenous herbo-mineral preparation (The Himalaya Drug Co.) is claimed to be a very useful comprehensive general tonic and restorative obtained from herbal ingredients. *Septilin* offers a broad spectrum control in eradicating recurrent and chronic dental infections³. *Geriforte* is used to promote healing and also improves the sense of well being to the patient⁴. This study was undertaken to evaluate the role of *Septilin* and *Geriforte* in the process of healing jaw fractures and control of infection.

MATERIALS AND METHOD

One hundred patients of varying age and sex were selected, having fractures of the middle one-third and/or mandible, attending the Post-graduate Clinic of Oral and Maxillofacial Surgery. Out of hundred patients, 50 were given antibiotics only to prevent infection at the site of injury or fracture, the remaining 50 cases received antibiotic with *Septilin* plus *Geriforte* combination. *Septilin* was continued in the doses of 1 tablet t.i.d. and *Geriforte* 1 tablet b.i.d., till the complete healing of the fracture. The fracture of jaws was treated by various methods. The fracture of the middle one-third was reduced and immobilized either by bone plates or by

splint or by internal or external fixation. Mandibular fractures were managed either by bone plates, transosseous wiring or circummandibular wiring with splint or by inter-maxillary fixation (I.M.F.). In cases of fracture, there is formation of hematomas at the site of fracture (most fractures of the mandible are compound in nature) and accumulation of food debris in the oral cavity, delays the process of healing at the fractured ends. This encourages the multiplication of bacteria and the greater the delay in obtaining reduction and immobilization, the more likely is infection to develop at the bone ends adjacent to the fracture site. Before immobilizing all debris had been removed and hematoma removed to prevent infection at the fractured site.

RESULTS

The results are reflected in the tables that follow.

Table I: Indicates the age and sex distribution of cases in middle one-third and mandibular fractures. Maximum numbers of cases were between the age group of 21 to 40 years and more common in male than in female.

Table II: Shows the duration of healing in middle one-third fractures with antibiotic only. **Table III** reflects the duration of healing in middle one-third fractures with antibiotic and *Septilin* plus *Geriforte* combination.

Tables II and III indicates that duration of healing is less when antibiotic was used with *Septilin* and *Geriforte* on confirmation by clinical union. Complications in cases treated without *Septilin* and *Geriforte* are shown in **Table IV**. These are oro-nasal communication, infection of the maxillary

sinus; sever ulcerations at the site bandage of head cap and loosening of pins.

The duration of healing in mandibular fractures with antibiotic only, can be seen in **Table V**. Details of the duration of healing in mandibular fractures when antibiotic was combined with *Septilin* and *Geriforte*, are shown in **Table VI**. **Table V and VI** indicates that duration of healing in mandibular fractures is less when antibiotic with *Septilin* and *Geriforte* was given on observation of clinical union.

Complications in cases of mandibular fracture treated without *Septilin* plus *Geriforte* combination are depicted in **Table VII**. The complications shown in Table VII are post-operative swelling, non-union and implant failure due to infection.

DISCUSSION

All fractures of jaws are usually compounded into the mouth or skin. Any infection at the site of injury or fracture may lead to delayed union or non-union of the fracture. The process involved in the repair and remodeling of bone are dependent upon the activities of a variety of cells. Consequently if the local circumstances are unfavorable for the proper working of the cells, healing will be impeded. Many of the osteocytes concerned with the healing of fractures will die if there is infection. Long standing infection will result in more resorption of the bone next to the fracture line than would otherwise occur. As the gap widens and the relatively susceptible osteogenic cells are more damaged than the less susceptible fibroblasts, the chances of bony union diminish. If there is presence of infection it delays in bone healing.

Fracture healing involves complex processes of cell and tissue proliferation and differentiation. Many factors are involved, including growth factors, inflammatory cytokines, antioxidants, bone breakdown (osteoclast) and bone-building (osteoblast) cells, hormones, amino acids, and uncounted nutrients. Normally active adult may require 2,500 calories a day, a bedridden injured patient with multiple fractures may need 6,000 calories per day⁵. If this demand is not met, the healing process is compromised⁶. Those with low protein status take longer to heal the fractured bone, and have more complications, including death⁷. Antioxidants-including vitamins E and C, lycopene, and alpha-lipoic has been suggested to be beneficial in suppressing the destructive effect of oxidant free radicals on whole body systems and improving fracture healing in animal models and cultured human cell lines⁸. The body's demand for both copper and zinc rises according to the severity of the trauma⁹. Zinc supplementation aids in callus formation, enhances bone protein production, and thus stimulates fracture healing¹⁰. After that, the diet provides the calcium necessary for fracture repair. Human studies showed that for best fracture healing both calcium and vitamin D should be obtained in optimum daily levels¹¹. It has also been known that bioactive silicon (silica) plays an important role in bone collagen synthesis. Bioactive silicon enhances the effects of calcium and vitamin D₃ on new bone formation¹². Vitamin B₆ is one of the B vitamins that has been linked to fracture healing¹³. Vitamin K is an essential part of the biochemical processes that bind calcium to bone and it is required for proper formation

of the osteocalcin bone protein. In addition vitamin K conserves calcium by reducing the loss of calcium in the urine¹⁴. Antibiotics are necessary in cases of compound fractures to prevent any infection at the site of injury and thus promote rapid union. The antibiotic was prescribed for only 5-7 days. As is well known, since combination of *Septilin* and *Geriforte* has the efficacy of an antibiotic and safety of a non-antibiotic, these drugs were prescribed along with antibiotic in this study and obtained good results, without any complications. In cases where the antibiotic alone was prescribed, there were chances of residual infection, which could result in delayed union, non-union or post-fracture swelling etc. When *Septilin* plus *Geriforte* along with antibiotic was used for seven days and *Septilin* plus *Geriforte* was continued till the period of immobilization, no such complications developed and the fracture ends healed rapidly. This indicates that *Septilin* plus *Geriforte* combination controlled the residual infection and results in rapid healing of bone fragments. *Geriforte* has been reported as a comprehensive metabolic tonic for improving the faulty adaptive response to trauma and stress common in physical injury¹⁵. In cases of middle one-third fracture of the Lefort type, there is likelihood of infection of maxillary sinus because of the involvement of the walls of the sinus in the fracture line. Infection of the maxillary sinus is very common in these cases if a proper antibiotic cover is not given. *Septilin* plus *Geriforte* along with antibiotic could prevent such infections. In this study, the cases of Lefort II fractures, antibiotic with combination of *Septilin* and *Geriforte* was given for 5-7

days, then the antibiotic was withdrawn and *Septilin* and *Geriforte* was administered till the period of immobilization, no infection of maxillary sinus was observed. In the control group two cases with involvement of the maxillary sinus were observed. This clearly indicates that *Septilin* plus *Geriforte* combination is beneficial in cases of middle one-third fracture. Row and William stated that teeth involved in the fracture line and compound fracture of the jaws may cause infection of the bone ends. They advised the use of wide spectrum antibiotics to retain the tooth and to prevent complications attributable to infection¹⁶. The use of *Septilin* which is an Ayurvedic medicine, in jaw fractures acts as an anti-inflammatory, antibiotic agent. *Geriforte* acts to promote healing of jaw and also it increases the well being of the individual¹⁷. These ayurvedic drug combinations can be used to prevent infection and to promote healing in jaw fractures without much complications that usually occurs in these cases.

CONCLUSION

The combination of *Septilin* and *Geriforte* are effective antibacterial and anti-inflammatory agents without toxic or hypersensitivity reactions in healing of jaw fractures. These agents are having a curative action and prevent recurrences.

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Table 1: Age and Sex distribution

Age Group	Septilin & Geriforte Group		Control Group		Total
	Male	Female	Male	Female	
20-40	25	3	26	4	48

41-60	11	2	10	2	25
> 61	7	2	6	2	17

Table 2: Duration of healing in middle one-third fractures with antibiotic only

Type of immobilization	No. of cases	Duration of healing(clinical union)
Bone plates	6	4 weeks
Arch bar with internal fixation	2	4-5 weeks
Arch bar with external skeletal fixation	2	5-6weeks
Total	10	

Table 3: Duration of healing in middle one-third fractures with antibiotic and *Septilin* plus *Geriforte*

Type of Immobilization	No. of cases	Duration of Healing (Clinical Union)
Bone plates	6	4 weeks
Arch bar with internal fixation	2	4 weeks
Arch bar with external skeletal fixation	2	4-5weeks
Total	10	

Table 4: Complication in middle one third fracture cases without *Septilin* plus *Geriforte*

Complications	No. of Cases	Type of fracture
Oronasal communication	4	Lefort II with mid-palatine split
Infection of the maxillary sinus	2	Lefort I&II
Sever ulcerations at the site of bandage of head cap	2	Lefort II
Loosening of pins	1	Lefort II

Table 5: Duration of healing in mandibular fractures with antibiotic only

Type of immobilization	No. of Cases	Duration of Healing (Clinical Union)
Bone plate	10	3-4 weeks
Arch bar with I.M.F.	10	5-6 weeks
Splint with circummandibular wiring	10	5-6 weeks
Transosseous wiring with I.M.F.	10	6-7 weeks
Total	40	

Table 6: Duration of healing in mandibular fractures with antibiotic and *Septilin* plus *Geriforte*

Type of immobilization	No. of Cases	Duration of Healing
Bone plate	10	3-4 weeks
Arch bar with I.M.F.	10	4-5 weeks
Splint with circummandibular wiring	10	5 weeks
Transosseous wiring with I.M.F.	10	5-6 weeks
Total	40	

Table 7: Complications in mandibular fractures when *Septilin* plus *Geriforte* were not given

Complications	No.of cases

Post- operative swelling and tenderness at the site of fracture	10
Non-union due to the infection of the tooth retained at the site of fracture for proper immobilization	4
Infection at the site of fracture resulting into implant failure	2

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