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Iodine iontophoresis as an adjunct treatment method of abscesses in the maxillofacial area

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Introduction

Abscesses are frequent cases of disease in the field of maxillofacial surgery. Incision and drainage are the goal of treatment supported by antibiotic therapy. Often abscesses in the maxillofacial area are associated with reflex trismus due to inflammation. The lockjaw decreases in most cases reluctantly.
Iodine iontophoresis is acknowledged as an effective method of treatment in therapy of cervicofacial actinomycosis. Because of causing hyperemia and being microbicidal and of its tonic effect on muscles we have been using iodine iontophoresis to soften residual infiltrations and chronic indurations which may occur as an consequence of the inflammatory process.
In order to evaluate the influence of iodine iontopheresis on therapy of abscesses in the maxillofacial area we designed a randomized study to investigate the clinical outcome of patients with reflex trismus due to inflammation.

Patients and methods

41 patients (23 female and 18 male) with abscesses in the maxillofacial area have undergone extraoral incision and drainage. The patients were randomized by date of birth. The mean age was 35 years randing from 16 to 62 years of age. Patients with diseases of the thyroidean gland, with an implanted cardiac pacemaker or pregnancy as well as allergic reactions to iodine were excluded from the study. All patients showed intensive reflex trismus due to inflammation. The localization of the treated abscesses is shown in table 1. All patients received extraoral incision, drainage and irrigation with physiological saline. Moreover all patients were treated with antibiotics intravenously.

location	iontophoresis	no iontophoresis
submandibular	9	6
perimandibular	6	6
parapharyngeal	3	6
pterygomandibular	3	0
massetericomandibular	0	2

Table 1. Abscess localization in the treatment and the control group

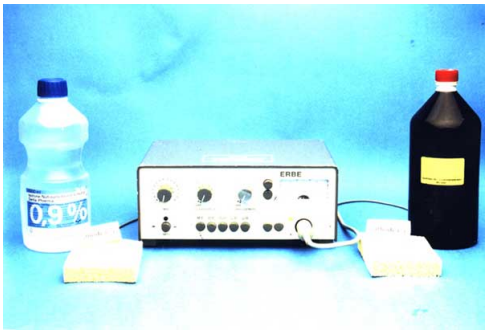

Figure 1. This figure shows the equipment necessary for iodine iontophoresis. It consists of a irritation current generator (Erbogalvan D2) and two sponges connected to the generator. The sponge connected to the negative pole(cathode) is moistened with the potassium iodine solution. The other sponge is connected to the positive pole (anode) and moistened with physiological saline.

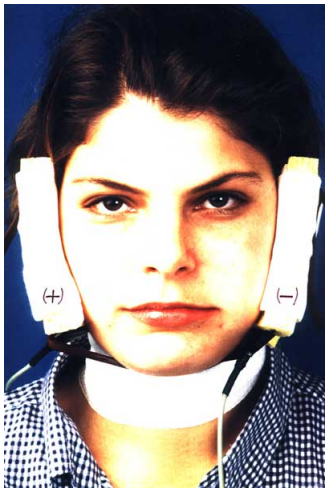

Figure 2. This figure demonstrated the application of the sponges in abscess treatment. The sponge moistened with the potassium iodine solution is placed over the abscess area. The other sponge moistened with physiologic saline is placed over the opposite cheek.

They received 10 million international units of Penicillin G once a day anf 500 milligram metronidazol three times a day. Patients of the control group were treated twice a day for 10 minutes with microwaves beginning at the third postoperative day. At the same time the study group received additional iodine iontophoresis treatment twice a day for ten minutes with a 5% potassium iodine solution by an electric current of 4 to 6 mA. The treatment method of iodine iontophoresis is illustrated in figures 1 and 2.
Maximal mouth opening was measured daily as the distance of upper and lower incisors (interincisor distance = IID). C-reactive protein (CRP) was examined every third day, leucocytes daily.
The interincisor distance and inpatient treatment time were the criteria for the effectiveness of iodine iontophoresis. Students t-test with a significance-level of 5% was used for the stastistical analysis.

Results

Data obtained comprised 21 patients of the study group and 20 patients of the control group.
Additional treatment with iodine iontophoresis was appreciated by patients of the study group. Allergic reactions of the skin did not occur. The average IID at the third postoperative day was 21 mm in the study group and 17.6 mm in the control group. The absolute and relative development of the IID in both groups are illustrated in figures 3 and 4. At the second day of iodine iontophoresis treatment the relative gain in IID was 38.4% in the study group in contrast to 21.7% in the control group. From this point onwards the differences between the two groups were significant. At the seventh day of treatment the study group showed a 100% improvement of the IID (control 60.6%).
The mean CRP in the study group at the time of abscess incision was 13 mg/dL and 9.8 mg/dL in the control group. In both groups CRP returned to normal until the seventh postoperative day. At the date of operation the mean number of leucocytes was 11,200µL in the study group and 13,000µL in the control group. In both groups leucocytes returned to normal at the second postoperative day. There were no significant differences among the patients in both groups. As a measure for the clinical improvement of the disease the IID-improvement influenced the inpatient treatment time.
Thus inpatient treatment time in the study group was reduced by two days to 9.6 days in the study group in contrast to 11.6 days in the control group.

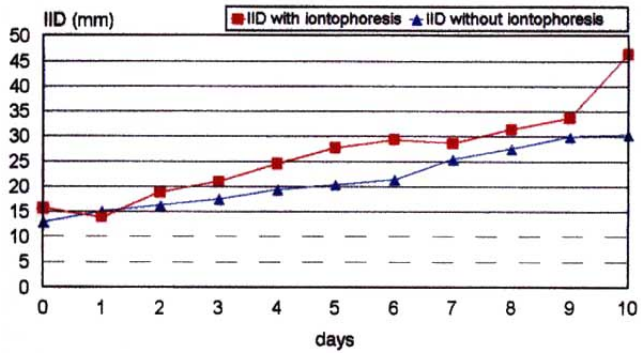

Figure 3. Average interincisor distance (IID) starting from the day of operation with and without iodine iontophoresis. Day 0: Day of operation, day 3: begin of iontophoresis.

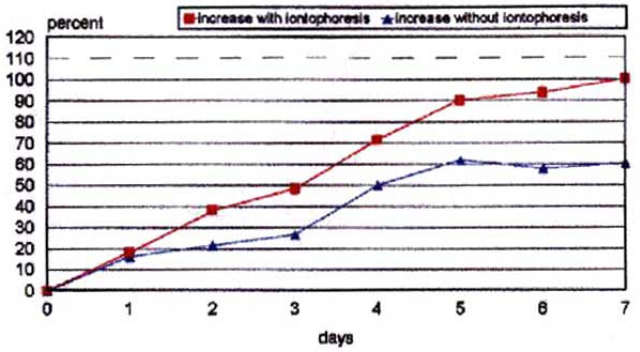

Figure 4. Relative improvement of the interincisor distance (IID) from the beginning of iodine iontophoresis (day 0).

Discussion

In iodine iontophoresis treatment the positive effects of the direct current are combined with the effects of the therapeutic agent in form of iodine ions. The positive effects of the direct current are vasodilatation even in deep tissue layers, analgesia as well as its tonic action on muscles.
By the use of a potassium-iodine solution under the cathode during iontophoresis, iodine ions can penetrate into deeper tissue layers to develop their positive effects such as vasodilatation and microbicism. Moreover, iodine ions can lower the viscosity of body fluids by the disaggregation of water molecule aggregates.
In our study iodine iontophoresis tourned out to be an effective additional treatment in abscesses of the maxillofacial area because it led to a faster increase in IID and to a shorter inpatient treatment time.

Literature

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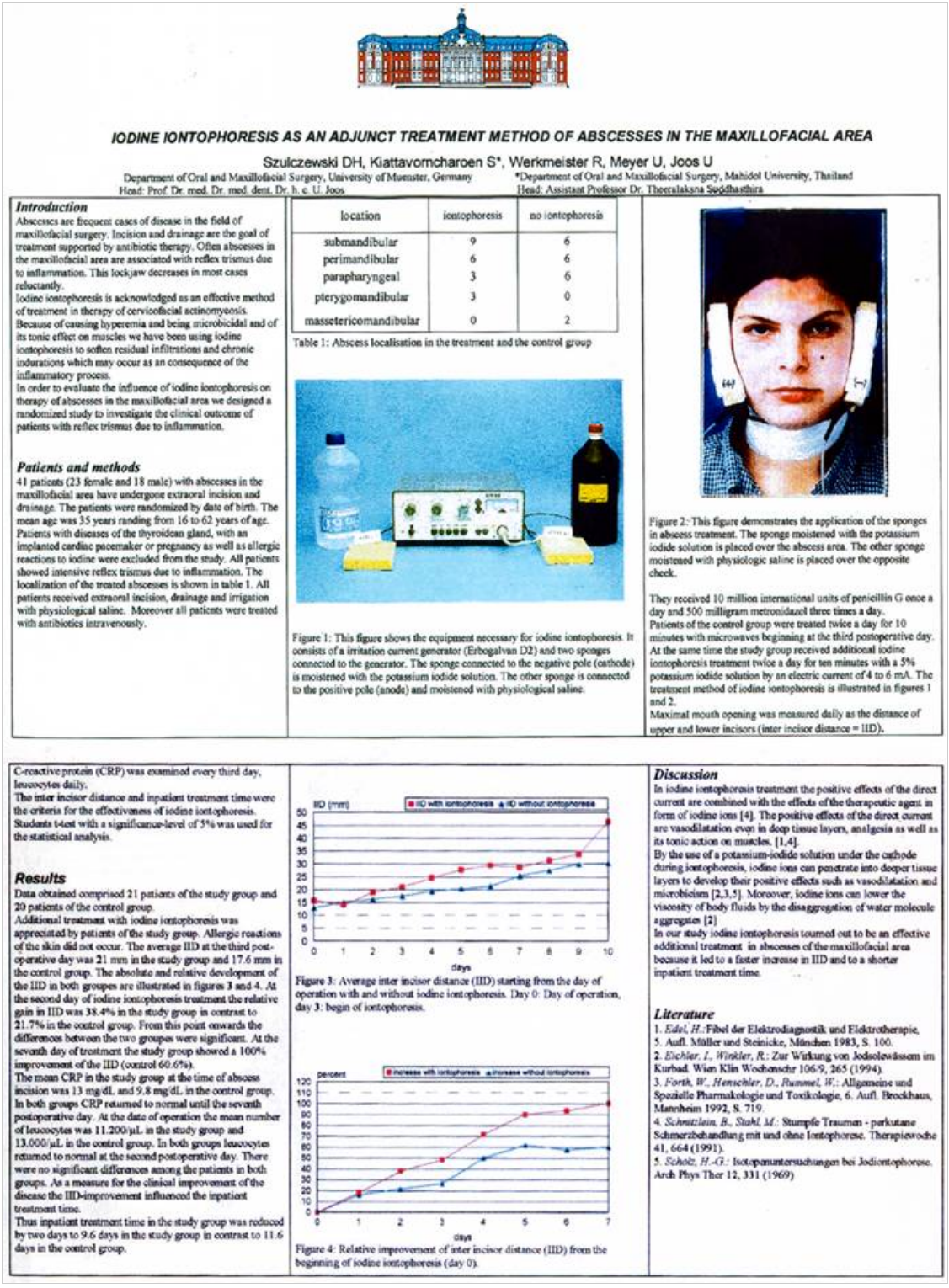

IODINE IONTOPHORESIS AS AN ADJUNCT TREATMENT METHOD OF ABSCESSES IN THE MAXILLOFACIAL AREA

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In iodine iontophoresis treatment the positive effects of the direct current are combined with the effects of the therapeutic agent in form of iodine ions [4]. The positive effects of the direct current are vasodilatation even in deep tissue layers, analgesia as well as its tonic action on muscles. [1,4].
By the use of a potassium-iodide solution under the cathode during iontophoresis, iodine ions can penetrate into deeper tissue layers to develop their positive effects such as vasodilatation and microbicism [2,3,5]. Moreover, iodine ions can lower the viscosity of body fluids by the disaggregation of water molecule aggregates [2]
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Literature

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