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Matrix Rhythm Therapy (MaRhyThe©): A Novel adjuvant treatment for OSMF- Report of 3 cases with a Brief Review

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ABSTRACT: Oral submucous fibrosis (OSMF) is an irreversible, prevalent, Oral potentially pre malignant disorder (OPMD) affecting Indian population. The disease causes fibrosis which leads to restricted mouth opening. It is a chronic progressive disorder that involves the oral mucosa and occasionally the pharynx and upper third of the oesophagus. The primary aetiological agent causing the disease is arecoline a chemical present in arecanut[1].The initial presentation of OSMF is inflammation which is followed by hypovascularity and fibrosis represented as blanching of the oral mucosa with a marble-like appearance.. Various treatment modalities are in use to treat OSMF mainly medical, surgical, or a combination of both but the success rate remains low. Physiotherapy interventions include ultrasound therapy, osteopathic mobilization and active physiotherapy exercises[3]. Despite of having these many management modalities the treatment becomes incomplete and inconclusive. A new physiotherapeutic approach using MaRhyThe© which is known to improve both elasticity and microcirculation of connective tissue in other diseases was used to treat trismus in mouth opening in OSMF.

KEYWORDS: Oral submous fibrosis (OSMF), MaRhyThe©(Matrix rhythm therapy).

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I. INTRODUCTION(11 Bold)

Oral submucous fibrosis (OSMF) is an irreversible, prevalent, oral potentially pre-malignant disorder (OPMD) affecting Indian population. It defines the disease as causing fibrosis which leads to restricted mouth opening. It is a chronic progressive disorder that involves the oral mucosa and occasionally the pharynx and upper third of the oesophagus. The primary aetiological agent causing the disease is arecoline a chemical present in arecanut[1].The initial presentation of OSMF is inflammation which is followed by hypovascularity and fibrosis represented as blanching of the oral mucosa with a marble-like appearance. Blanching may be localized or diffused. In some cases, small vesicles may develop that rupture and form erosions. Later in advanced stages the disease characteristically shows fibrous bands which restrict mouth opening (trismus). Trismus further leads to problems in maintenance of oral hygiene, speech, mastication, and swallowing. It becomes difficult to retract or evert the lips leading to an elliptical shape of the oral sphincter[2].

Various treatment modalities are in use to treat OSMF mainly medical, surgical, or a combination of both but the success rate remains low. Numerous symptomatic approaches have been tried to reduce the symptoms such as corticosteroids along with nutritional supplements, surgical excision of bands, laser fibrotomy and various Ayurveda and oral Physiotherapy interventions. Lasers can provide an alternative and better means for surgical fibrotomy in moderate OSMF cases. Physiotherapy interventions include ultrasound therapy, osteopathic moilization and active physiotherapy exercises[3]. Despite of having these many management modalities the treatment becomes incomplete and inconclusive.

Hence in order to try a new hope Matrix Rhythm Therapy (MaRhyThe©) has been introduced in the list of treatment modalities.

In 1943 Dr. Hubert Rohracher discovered that muscles constantly vibrate day and night concentrated in the range between 7-13 Hz similar to brain's alpha waves. Later wherein Dr.Ulrich G Randoll developed a special therapeutic device called as MatrixMobil® that has the capability to restore the natural, healthy mode of vibration to cells which are out of their normal rhythm in cases of pain and degeneration. MatrixMobil® modality utilizes vibrations in the frequency range of the brain's alpha rhythm (8-12 Hz), to relieve painful stiffening and make connective tissue more elastic and permeable. This has been found helpful in treating diseases with areas of deficient microcirculation. These Vibratory mechanisms reduce inflammation and release muscular spasm and also increase peripheral blood flow.

Applying these special therapeutic features, MaRhyThe© has been previously used to treat various disorders such as swelling, hematomas, edema, and congested lymphatic drainage. It has also been used in cases of club foot, schleroderma and frozen shoulder[4]. The connective tissue in OSMF shows features such as decreased microcirculation and increased fibrosis which reduces the elasticity of muscles[5]. This prompted us to conduct a pilot study wherein OSMF patients were treated with MRT, to evaluate its effect in improving trismus. MaRhyThe© is known to improve both elasticity and microcirculation of connective tissue in other diseases, we hence hypothesized that mouth opening in OSMF should improve with Matrix Rhythm Therapy.

I. **Inclusion criteria-** Patients with stage 1 and stage 2 OSMF (Chandramani More et al classification), who were ready to give an informed consent, with no systemic diseases were included in the study.

II. **Exclusion criteria-** Patients with systemic diseases and not ready to give an informed consent were excluded.

III. **Materials and Method**- Patients were selected based on inclusion criteria from the Outpatient Department of Oral Medicine And Radiology from Maratha Mandal'sNathajirao G Halgekar's Institute Of Dental Science And Research Centre, Belagavi.

IV. TABLE SHOWING CLINICAL FEATURES ND TREATMENT DETAILS OF PATIENTS.

Sl.no	Age/ gender	Habit	Signs and smptoms	Stage of OSMF- according to More.et.al	Treatment	Improvement in mouth opening after MRT
1	27/M	Gutka chewing with pieces of areca nut at least 5 times a day and since past 15 years	Burning sensation on consumption of spicy food with associated difficulty in mouth opening. Generalized pale oral mucosa with fibrotic bands that were palpable bilaterally over the buccal mucosa	S_2M_1	Patient was Counseled to quit habit. Cap. Lycored followed by matrix thythm therapy sessions for a period of 45 minutes.	IMO-30mm $PostR_x$-33mm m.o=post-pre =3mm
2	38/M	Chewing gutka chewing 4-5 times a day since 20 years	Burning sensation on consumption of spicy food with associated difficulty in mouth opening. generalized pale oral mucosa with fibrotic bands that were palpable.	S_2M_3	Patient was Counseled to quit habit. Cap. Lycored followed by 2 sessions of matrix thythm therapy sessions for a period of 45 minutes.	IMO-20mm $PostR_x$-24mm m.o=post-pre =4mm
3	39/M	Chewing gutka chewing 4-5 Times a day since 20 years.	Burning sensation on consumption of spicy food with associated difficulty in mouth opening. generalized pale oral mucosa with fibrotic bands that were palpable.	S_2M_1	Patient was Counseled to quit habit. Cap. Lycored followed by matrix thythm therapy sessions for a period of 45 minutes.	IMO-30mm $PostR_x$-35mm m.o=post-pre =5mm

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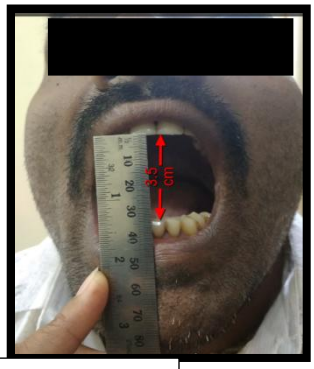
Fig- patient undergoing MaRhyThe© in a supine position.


Case 1- pre and post MaRhyThe©


Case 2- pre and MaRhyThe©.

Case 3 – pre and post MaRhyThe©

V.Methodology

After approval from the Institutional Ethical Committee, patients were subjected for MaRhyThe©. A detailed case history was taken, along with clinical examination. Clinical features were recorded and patients were diagnosed clinically as OSMF with signs such as blanching of oral mucosa, presence of fibrous band on palpation, history of burning sensation on consumption of hot and spicy food and were grouped into various stages. Then patients were subjected to MaRhyThe© which was conducted at a

Private Physiotherapy Centre, Belagavi. The improvement in mouth opening Pre and post matrix therapy was measured as inter-incisal distance.

VI.Procedure of MaRhyThe©: Patient was asked to lie down in a supine position with head facing upwards. MaRhyThe© was given starting from the cervical spine, scalp, TMJ and face bilaterally. Talcum powder was used as a medium to reduce friction between the skin and oscillator of MaRhyThe© unit. Treatment was provided for 45 minutes to each patient. For case 1 and case 3 a single sitting MaRhyThe© session and for case 2, two sittings of MaRhyThe© was given.

VII.Discussion

Oral submucous fibrosis is a chronic, insidious, disabling, potentially malignant disease that results in progressive juxtaepithelial inflammatory infiltrate, fibrosis of the oral soft tissues leading to marked rigidity and an eventual inability to open the mouth[6].The prevalence of OSMF cases in India has been reported to be in the range of 0.2 to 0.5% with a malignant transformation rate about 3-7.6% of all cases. The mouth opening in various stages (Interincisal mouth opening) is categorized into M1 (upto or >35mm), M2 (25–35 mm), M3 (25-15mm) and M4 (<15mm) empirical and symptomatic in nature[7]. The major targets of treatment are in the forms of anti-inflammatory, oxygen radical-scavenging, antifibrotic modalities etc.Oral physiotherapy in the literature has shown beneficial results in OSMF patients[2]. Concurrent treatment with physiotherapy and intralesional injections was found to improve the mean mouth opening, tongue protrusion and cheek flexibility in a few studies done by Vijaykumar m et al (2013)[8], Goyal M et.al (2017)[9].

Fibrosis is associated with quantitative and qualitative alterations of collagen deposition within the subepithelial layer of the oral mucosa. El Labben et.al electron microscopic studies reported muscle degeneration in OSMF which significantly affects the already existing trismus[10].

In patients with musculoskeletal problems, anaerobic metabolism is activated because of reduction in blood flow and microcirculation. Massage is a physiotherapeutic approach widely used to improve blood circulation. The types of massage include petrissage, taponement, friction and vibration. Vibration massage is used to improve the circulation and to facilitate, muscle relaxation. Vibration devices with edited speed and frequency can be used for different indications. MaRhyThe© is used in special education and rehabilitation centers for neurologic, orthopedic and physical therapy; however the level of evidence is low[11]. MaRhyThe© is a type of vibro-massage therapy that has capability to cause more mechanical and reflex stimulation than conventional massage and is thought to be compatible with the natural vibration frequency of the muscle, which is considered to contribute to the therapeutic effects effectiveness of the same.

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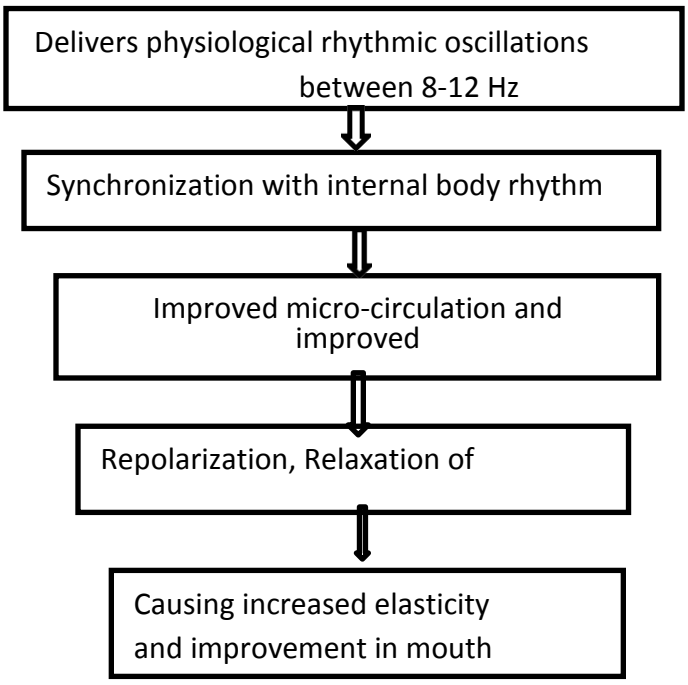
In MaRhyThe© physiotherapist applies longitudinal strokes by pushing the probe of the device towards the soft tissues as compared to conventional massage therapy. The compression effect created by MaRhyThe© causes release of more efferent stimuli and soft tissue mobilization. Callaghan suggested that the major effect of mechanical vibration massage is to increase the blood circulation leading to tonic vibration reflex causing active contraction of muscles. This muscle contraction causes an increased blood supply. A study conducted by Taspinar et al concluded that MaRhyThe© improved the blood circulation by 35% compared to conventional massage in young females[4].

Cox et al in 2009 conducted a study to check for effectiveness of physiotherapeutic exercises in OSMF patients and concluded substantial improvement in mouth opening in patients treated with physiotherapy[12].

This study was the first of its kind wherein MaRhyThe© was used in treating trismus in OSMF patients.

VIII. Postulated mechanism of action of MRT in OSMF



Case 1, Case 2 and case 3 were provided with sessions of matrix with the presence of clinical signs of OSMF. Case 2 was given 2 sessions of matrix due to more evident restriction in mouth opening compared to the other two cases. There was immediate improvement in mouth opening after MaRhyThe© session with improved elasticity and flexibility in cheek retractiblity which was noted. MRT was successful in providing the clinical mouth opening since it utilizes the principle of using improved microcirculation in deficit areas and relieving the stiffness reliving elasticity in muscle contracted areas.

Future scope for research should include will the clinical improvement remains stable after treatment and Does clinical improvement in mouth opening translate into change in histopathological grading. Can similar results be seen in Grade 3 and Grade 4 patients and females as well and will multiple sitting results in continued improvement in mouth opening.

IX.Conclusion

Our pilot study has shown that MaRhyThe© was a cost effective, successful treatment modality in providing immediate relief in the range of about 3-4mm mouth opening in OSMF patients with no observable adverse effects. . Further studies to evaluate the efficacy of matrix rhythm therapy in treating OSMF patients with larger sample size and long term follow up should be carried out.

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