

# Ultrasonography for the volumetric analysis of the buccal fat pad as an interposition material for the management of ankylosis of the temporomandibular joint in adolescent patients

Vishal Bansal<sup>a,\*</sup>, Avi Bansal<sup>a</sup>, Apoorva Mowar<sup>a</sup>, Sanjay Gupta<sup>b</sup>

<sup>a</sup> Department of Oral & Maxillofacial Surgery, Subharti Dental College, Swami Vivekanand Subharti University, NH-58, Meerut By Pass Road, Meerut (Uttar Pradesh), 250005, India

<sup>b</sup> Healthcare & Imaging Centre, 43, Shivaji Road, Near N.A.S. College, Meerut (Uttar Pradesh), India

Accepted 16 June 2015

Available online 10 July 2015

## Abstract

The aim of this study was to analyse preoperatively with ultrasound the minimum volume of buccal fat that would be required for interposition of a pad after gap arthroplasty, and to emphasise the value of such a pad in the management of ankylosis of the temporomandibular joint (TMJ) during a short term follow up. Nineteen patients with ankylosis of the TMJ (22 joints) were selected, whose mean (SD) mouth opening was 4.9 (3.7) mm. In 10 joints in which the mean (SD) volume of the buccal fat pad was 0.7 (0.2) ml, the harvested buccal fat was inadequate for interposition, so they were treated with other materials. The remaining 12 joints had a mean (SD) volume of 1.1 (0.3) ml, which gave enough fat for interposition after gap arthroplasty. Investigation with ultrasound at 15 days and 6 months postoperatively showed that the fat pad was viable and the volume had shrunk by 28%. The 6-month postoperative computed tomographic (CT) scan showed little or no heterotopic calcification. We conclude that a buccal fat pad with a preoperative mean (SD) volume of 1.1 (0.3) ml is easy to harvest as interposition material. At a mean follow up of the 12 joints after 31 (range 24–36) months there was progressive improvement in mouth opening with a mean (SD) of 32.5 (5.0) mm, which established that a pedicled buccal fat pad is a stable, efficient, viable soft tissue barrier in the management of ankylosis of the TMJ.

© 2015 The British Association of Oral and Maxillofacial Surgeons. Published by Elsevier Ltd. All rights reserved.

**Keywords:** Buccal fat pad; Temporomandibular joint ankylosis; Ultrasonography.

## Introduction

True ankylosis of the temporomandibular joint (TMJ) is one of the most upsetting articular conditions, which causes not

only functional but aesthetic, psychological, and physical disturbances as well. Management of the fused TMJ is still a challenge for maxillofacial surgeons, as they need to maintain a good permanent range of mandibular movements and correct the facial asymmetry.<sup>1</sup>

Ankylosis of the TMJ is not a single event, and authors have suggested many factors that can cause it.<sup>2</sup> The meniscus plays a large part in preventing the adhesion of articular surfaces, but if it is damaged or displaced the condyle and glenoid fossa are more likely to fuse.<sup>3</sup>

\* Corresponding author at: Department of Oral & Maxillofacial Surgery, Subharti Dental College, Swami Vivekanand Subharti University, NH-58, Meerut By Pass Road, Meerut (Uttar Pradesh) – 250005, India.  
Tel.: +91-121-2439052/121-2439043x2068;  
fax: +91 121 2439067/9837233950 (mobile).

E-mail address: [drbansalvishal@rediffmail.com](mailto:drbansalvishal@rediffmail.com) (V. Bansal).

The main goals of treatment are to establish the range of movement of the mandible and the function of the jaw, and to prevent recurrence, restore appearance, and achieve satisfactory growth potential and functional occlusion for the patient.<sup>4,5</sup> Various surgical techniques have been described to achieve these goals, including ramus ostectomy, condylectomy, and gap arthroplasty.

The use of an interposition material to minimise the risk of recurrence was suggested with, the idea being to minimise the dead space and preserve a barrier of soft tissue between the 2 raw surfaces and thereby reduce the chance of them reuniting. Various materials such as autogenous (temporalis myofascial flap, fascia lata, dermal graft, auricular graft, and buccal fat pad) and different alloplastic materials (gold foil, tantalum foil, Silastic®, and proplast/Teflon®) have been described and discussed, and all have their own advantages and disadvantages.<sup>6</sup>

Wolford and Karras<sup>7</sup> and Dimitroulis<sup>8</sup> discussed using fat from the abdomen or groins for interposition, and Rattan<sup>9</sup> was the first to describe the technique of harvesting pedicled buccal fat pad in 2 patients with reankylosis of the TMJ. Advantages of this technique are its close proximity, and the lack of morbidity from a second surgical site. Gaba et al.<sup>10</sup> investigated the fate of buccal fat pads with magnetic resonance imaging (MRI) for a year, but were able to assess only actual number of cases have been quoted and is not the percentage. 15 of their 23 joints because of metal artefacts. However, they did not include volumetric analysis and postoperative shrinkage in their study.

On English literature search there are no available studies that have evaluated the minimum required amount of buccal fat required for interposition in ankylosis of the TMJ preoperatively, we designed this study using ultrasound (USG) as a diagnostic tool to investigate preoperatively the possibility of harvesting buccal fat in suitable volume, and its efficacy and fate as an interposition material. Computed tomography (CT) was also used after 6 months to rule out any sign of the heterotopic calcification that is responsible for reankylosis.

## Patients and methods

Nineteen patients with ankylosis of the TMJ (22 joints) were included in this prospective study. Their mean (SD) age was 11 (range 5- 17) years. It was explained to all the patients that if we failed to harvest enough buccal fat other substances could be used, and they or their parents gave informed consent.

All patients were assessed for mouth opening and range of mandibular movement, and had a preoperative orthopantomograph and CT to assess the extent of the ankylotic mass (Fig. 1). All the cases were evaluated preoperatively by a single radiologist for volumetric analysis of the buccal fat pad. The ultrasound machine E-9 was manufactured by General Electronics (Bangalore, India) (Fig. 2). Patients were asked to fill the cheek with air, which helped the radiologist to



Fig. 1. Coronal computed tomographic image showing bilateral Sawhney's type III ankylosis of the temporomandibular joint.

know the exact boundaries of the buccal and body parts of the fat pad. The landmarks for calculating the size of the pad were based on its character and its visibility on USG, which could be clearly distinguished from skin, subcutaneous tissue, muscle, and nearby structures.

After fiberoptic intubation, we used the Al Kayat Bramley modification of the preauricular approach to expose the ankylotic mass using an aseptic technique. The patients were treated according to Kaban's protocol.

We used a standard technique to harvest the buccal fat pad. We prefer to stand in the 11 o' clock position if the ankylosis is on the right, and the 1 o' clock position if it is on the left. Under direct vision a periosteal elevator is inserted anteriorly in the subperiosteal plane at the anterior border of the coronoid process. After exposure and retraction at the level of the coronoid notch, the buccal fat pad is pushed outwards with the finger of the other hand placed intraorally, and bulges into the surgical field. This bulge helps to decide the correct plane of the pad. With the operator on the side being operating on, and under direct vision, the plane is opened using a

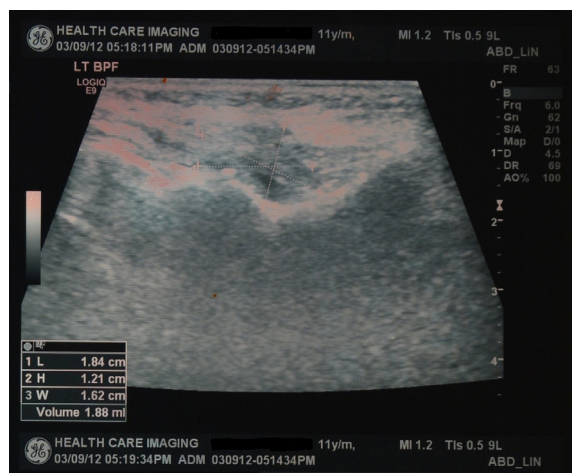


Fig. 2. Volumetric analysis of a buccal fat pad from the left cheek.

Download English Version:

<https://daneshyari.com/en/article/3123021>

Download Persian Version:

<https://daneshyari.com/article/3123021>

[Daneshyari.com](https://daneshyari.com)