



# Direct Sinus Lift and Immediate Loading of Dental Implant- Clinical Reports and Preliminary Radiographic Results

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## Case Report

Volume 4 Issue 1

Received Date: March 16, 2020

Published Date: April 07, 2020

DOI: 10.23880/ijst-16000143

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## Abstract

Edentulous posterior maxilla is the most challenging area for the implant placement. Because of increase pneumatization of sinus in this area available bone height is inadequate for primary stability of implants. Sinus lift procedure followed by floor augmentation is the only option to increase the availability of bone in this area. Sinus lift procedure can be direct or indirect type depending on available bone height. For augmentation of floor the grafting materials varies from Autogenous bone grafts to xenografts and alloplastic material. We can also use combination of these to increase the success rate. In our cases we used direct sinus lift with MILA SLA Kit and augmentation with Bone Plus TM bone graft with successful immediate implant placement by Anyridge Megagen company in Maxillofacial and Dental Department of M P Shah Hospital, Kenya.

**Keywords:** Sinus lift; Implants; Bone graft; Ridge augmentation

## Introduction

Edentulism is a condition that keeps many people away from 'feeling their best'. Dental Implants are currently the closest thing technology has to offer in lieu of a natural tooth. Implant success in the posterior maxilla is frequently challenged by unfavorable post-extraction resorptive patterns, pneumatization of the maxillary sinus [1]. The maxillary sinus is the largest of all paranasal sinuses. It lies in the body of the maxilla. It is pyramidal in shape, with its base directed medially towards the lateral wall of the nose, and the apex directed laterally in the zygomatic process of the maxilla [2]. Absence of teeth leads to rapid resorption of alveolar bone in all dimensions due to increased osteoclastic activity in sinus membrane and lack of intraosseous stimulation by periodontal ligament fibers [2]. The outcome of implants depends on the volume and quality of surrounding bone. The presence of lower level of sinus floor in the edentulous area in posterior maxilla limits the implant placement. For gaining

the adequate bone height in posterior maxilla we have to do the grafting of the maxillary sinus floor.

The sinus augmentation technique was first discovered by Tatum in 1977 through a lateral window and was first published by Boyne and James in 1980 [3-5]. The original technique of Tatum was later modified by many researchers for the better precision of sinus grafting [6]. After sinus lift for bone grafting there is range of materials available including allografts, xenografts and alloplastic materials. Autogenous bone grafts are always better in outcome than other type of grafts but have other limitations. For the successful outcome of an implant there are primary stability factors and secondary stability factors. Primary factors are implant related and secondary factors are the host environment related [7]. The aim of this case report is to see the possibility and outcome of direct sinus lift with lateral window approach and immediate placement of dental implant.

## Case Reports

### Case Report 1

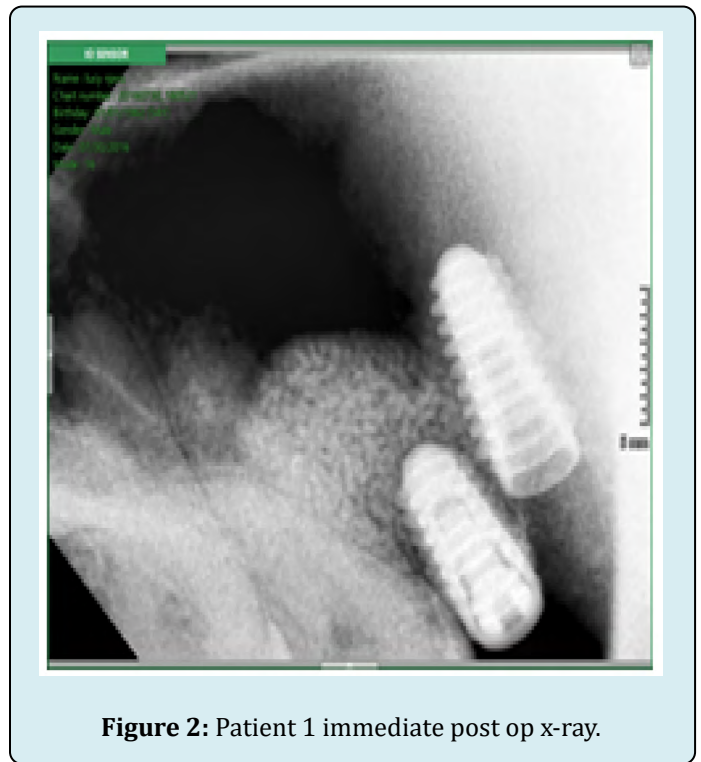
A 54-year-old female patient was referred to Department of oral and maxillofacial surgery in M.P Shah Hospital, Kenya for replacement of missing 16. Patient was a known diabetic and she lost her teeth because of periodontal problem. On examination, she was found to have missing 15 and 16. She was being edentulous since last three years. She had been given options for replacement of missing teeth by bridge or implants. Out of that she opted for implants. On radiological examination, (Figure 1) the available bone height was 3mm in 16 region which confirmed need for sinus lift procedure.



**Figure 1:** Patient 1 pre-op available bone height.

The same thing explained to the patient and she had given consent for direct sinus lift augmentation and immediate implant placement. Preoperative antibiotic course started 1 day before the operation and continued till 6<sup>th</sup> post-operative day. A midcrestal, full-thickness incision was performed in the edentulous area along with crevicular incision from 14 till 17. Vertical relieving incision was given along 17 region. Once the flap was reflected, the implant osteotomy site was prepared by carefully preserving the sinus membrane. The cavity was filled using bone graft Bone Plus™ 0.5 gm following that Anyridge implant by Megagen size diameter 5.0 mm and length 11.5 mm was used. Immediate post-op RVG (Radiovisuograph) & OPG (Orthopantomogram) was

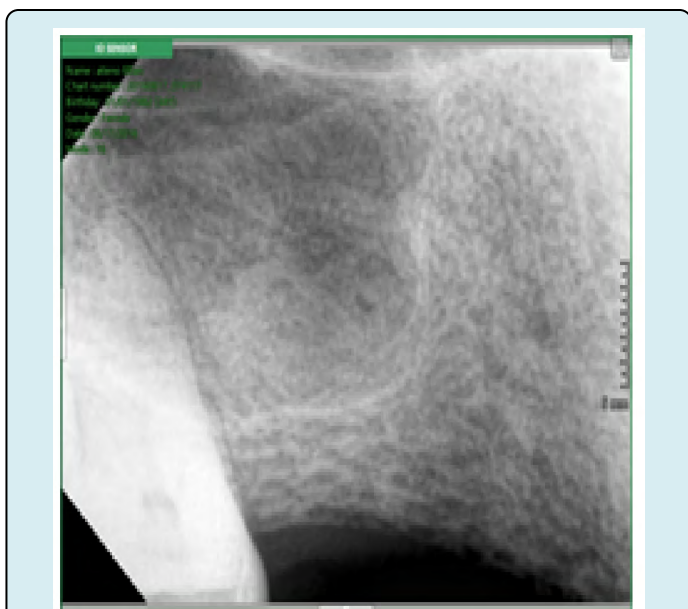
taken (Figure 2). The patient was followed up till two month post-operative day. There was no sign of implant failure. Healing was satisfactory.



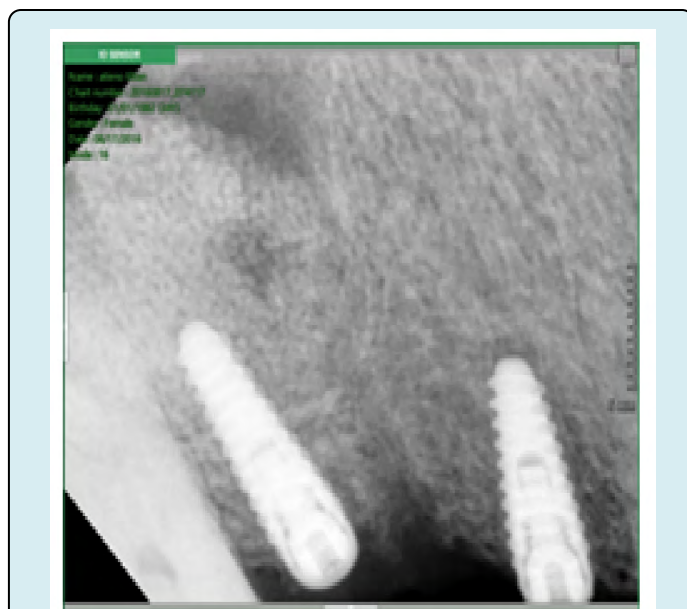
**Figure 2:** Patient 1 immediate post op x-ray.

### Case Report 2

A 34-year-old female patient was referred to our Department for replacement of missing 16 with implant. Patient was a known diabetic. On clinical examination missing 15 and 16 was noted. She was edentulous since 1 year. Cause of Edentulism was periapical abscess. She had been given all the options for replacement of missing teeth, out of which she had selected direct sinus lift. On radiological examination, the available bone height in 16 region was 4mm which confirmed need for sinus lift procedure (Figure 3). Patient had given consent for direct sinus lift augmentation and immediate implant placement. Preoperative same antibiotic protocol was followed. A midcrestal, full-thickness incision was performed in the edentulous area along with one posterior vertical relieving incision. Once the flap was reflected, the implant osteotomy site was prepared by carefully preserving the sinus membrane. The cavity was filled using bone graft Bone Plus™ 0.5 gm following that Anyridge implant by Megagen size diameter 4.0 mm and length 13 mm was used. Immediate post-op RVG & OPG was taken (Figure 4). The patient was followed up till two month post-operative day. There was no sign of implant failure. Healing was satisfactory (Table 1).



**Figure 3:** Patient 2 pre-op available bone height.



**Figure 4:** Patient 2 immediate post op x-ray.

**Table 1:** Sociodemographic and clinical characteristics of two patients were as follows –

	Patient 1	Patient 2
Age /sex	54/ Female	34/ Female
Marital status	Married	Married
Education level	Master degree	Undergraduate
Religion	Christen	Christen
Occupation	Accountant	Teacher
Oral habits	No Para functional habits	No Para functional habits
Missing teeth	16,15	16,15
Oral hygiene	Average	Average
Medical condition	Diabetic	Diabetic
Available bone height	3mm	4mm
Cause of tooth loss	Periodontitis	Periapical abscess

## Discussion

Availability of inadequate bone in the posterior edentulous maxilla is always a limitation for the implant placement. To overcome this problem sinus lift and floor augmentation has become a routine procedure. There are two types of technique for sinus lift, direct sinus lift and indirect sinus lift. Selection of technique usually depends on the available bone height below sinus floor. Direct sinus lift originally described by Tatum is usually indicated when available bone height is less than 5mm. Indirect sinus lift or Summers osteotomy was developed by Summer. He used osteotomes of different sizes to lift the sinus via crestal approach. This technique is indicated when available bone

height is more than 6mm [6]. There are various materials available as substitute of bone for grafting. Autogenously bone grafts are always considers as the best option because of its osteoconductive and osteoinductive potential [8]. But according to the literature implants placed in grafts which mixture is of autogenously and synthetic material have better outcome than implants using only Autogenously grafts [9]. Autogenously bone grafts even though they are best options but they need second surgical site which is not comfortable with many patients. To avoid second surgical site other type of grafting materials like allografts and xenografts are also very popular. Now a days sinus lift surgery became very popular for maxillary posterior implants. This surgery is related with many complications also. Considering the complications,

sinus membrane perforation was found to be the most common complication. Sinus perforation does not affect the osseointegration of implants if the size of perforation is less than 5mm. if the size of perforation is larger than 5mm it can be repaired and results showed that repaired sinus with graft and ePTFE membranes also have good prognosis [10-12]. In conclusion, sinus lift surgery followed by augmentation of floor and immediate implant placement is very good option for restoring edentulous atrophic maxilla provided proper planning, case selection and aseptic technique has been followed.

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