



# ALTERNATIVE TO LATERAL APPROACH FOR SINUS AUGMENTATION THROUGH CREST(ALSAC)

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## ABSTRACT

Surgical implant placement in the posterior maxilla is often complicated by pneumatized sinuses. Various sinus augmentation techniques, including the transalveolar technique, bone cylinder, antral membrane balloon elevation, and minimally invasive approaches, have been developed to overcome this.<sup>1,32</sup> However, these techniques often require complex tools and procedures, leading many clinicians to refer such cases. This paper discusses and evaluates the ALSAC technique compared to the traditional lateral approach. It highlights the potential for achieving similar or better bone volume without extensive tools or causing tissue damage. The ALSAC technique's simplicity and predictability make it applicable to a variety of cases, regardless of pneumatization extent. This method enables clinicians to use osteotomy for the implant to conduct a hydraulic lift of the Schneiderian membrane and perform augmentation using a magnetic mallet.

## INTRODUCTION

Maxillary sinus augmentation (MSA) procedures, crucial for dental implant placement in the posterior maxilla following severe bone loss, have evolved significantly since Hilt Tatum first used the maxillary sinus cavity for bone grafting in 1970.<sup>1</sup> The modern procedure diverges from the original sinus lift grafting process designed by Boyne and James, with numerous articles exploring different grafting materials and technique modifications.<sup>2</sup> Summers introduced a method in 1994 that employed a crestal approach to the sinus, fracturing the sinus floor bone, reflecting the overlying membrane, and inserting an implant to tent the membrane and allow natural bone fill. This technique, with later modifications of adding grafts, advised lifting only 3-4mm.<sup>29</sup> The technique this article discusses adopts key elements from earlier methods, streamlining MSA with a crestal approach that replaces invasive lateral procedures and employs a Magnetic Mallet for hydraulic sinus elevation.

## DISADVANTAGES OF LATERAL WINDOW

- The lateral window technique has several drawbacks including a **high failure rate of 7%-35%**, necessitating large flap openings and a second osteotomy on the lateral wall for sinus access.<sup>37</sup>
- It involves intense instrumentation that, given the Schneiderian membrane's variable thickness, **heightens the risk of membrane tear/perforation**.<sup>36,37</sup>
- The window closure is challenging and entails **additional cost and materials**.
- **Post-operative bony closure of the opening** is another concern, as is **excessive bleeding from arterial injury** during instrumentation.

## MATERIAL & METHOD

A total of 58 patients presented with pneumatized sinus requiring augmentation with mean crestal bone height of 3.52mm. Random selection of subjects was done and divide into 2 groups. Group A were treated with traditional lateral approach and Group B treated by the alternate to Lateral Approach for Sinus Augmentation through Crest (ALSAC). Three different measurements were taken from Group A with 46 subjects; 55 procedures and mean crestal bone height of 2.5mm for the Lateral Approach. Same three measurements were taken for Group B with 32 subjects; 41 procedures and mean crestal bone measurement of 2.27 mm for Alternate to Lateral Approach for Sinus Augmentation through Crest (ALSAC) discussed in this study. The resulting bone height from each technique was evaluated one year post functional loaded implant supported restorations.

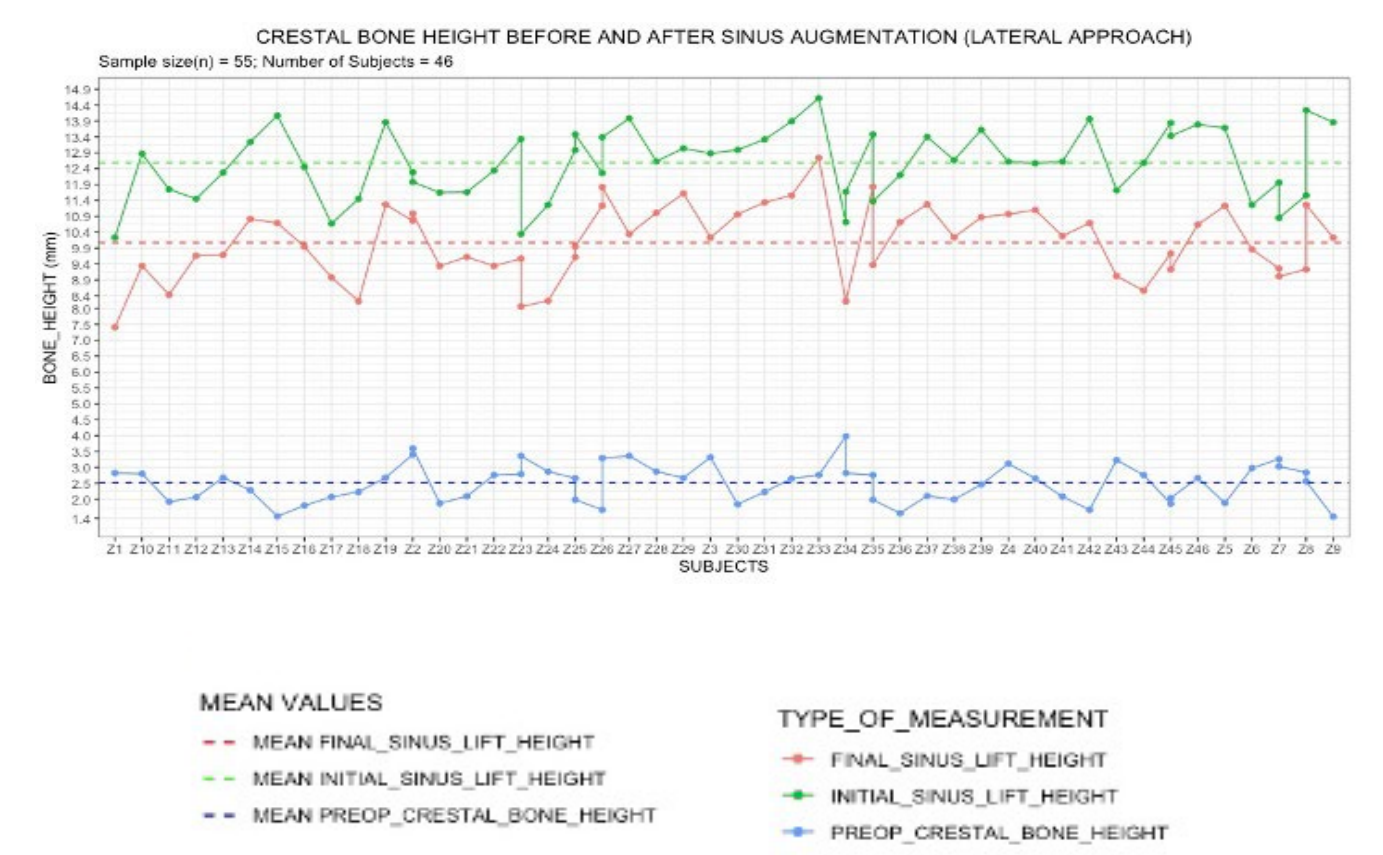
## ALSAC SURGICAL PROTOCOL SUMMARY

1. Discuss and obtain patient consent for treatment. Administer antibiotic prophylaxis.
2. Perform crestal approach 1mm short of sinus floor using a Magnetic Mallet for perforation.
3. Administer pre-operative antibiotics and anti-inflammatory meds a day before surgery. Perform surgery under local anesthesia and with cone-beam imaging.
4. Introduce saline into the sinus cavity through osteotomy with monojet syringe, cut and sized to fit 2mm into the osteotomy, displacing the Schneiderian membrane and creating space for biomaterial.
5. Crestally place the implant for optimal healing and bone remodeling. Avoid removable prosthesis during healing.
6. Administer pre-operative antibiotics and anti-inflammatory meds a day before surgery. Perform surgery under local anesthesia and with cone-beam imaging.
7. Perform osteotomy short of sinus floor, verify sinus cavity opening, and check for perforations.
8. Lift the Schneiderian membrane using hydraulic pressure via a syringe filled with saline.
9. Repeat to achieve optimal displacement.
10. Pack allogenic particulate bone into the sinus cavity in small increments. Use Magnetic Mallet osteotome to push bone into cavity.
11. Place Dental implant at the crest with minimum 35Ncm torque. Monitor ISQ and hand torque measurements. Achieve tension-free primary closure with sutures.
12. Take post-op CBCT to confirm bone particle incorporation. Prescribe antibiotics and advise mild over-the-counter analgesics.
13. Monitor patients for signs of discomfort, inflammation, and erythema in post-op evaluations. Schedule follow-ups at one day, one week, four weeks, eight weeks, and six months.
14. Take CBCT at one-year to evaluate successful, functional restoration with fully osseointegrated implants & graft consolidation height.

## DATA ANALYSIS/STATISTICAL METHODS

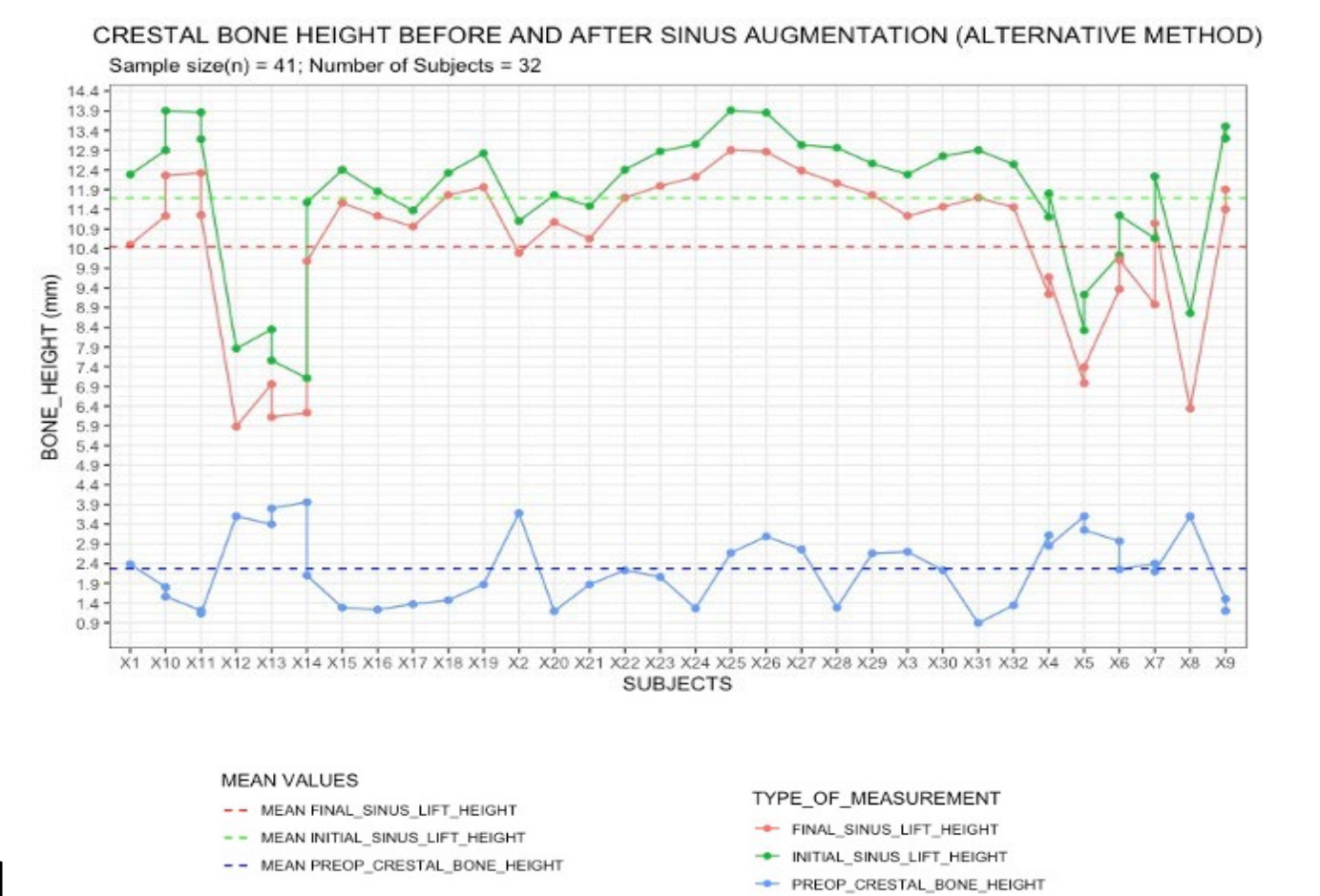
### 1. LATERAL APPROACH

The graph below shows three different measurements taken from **46 subjects** before and after placement of a surgical implant in the posterior maxilla **using lateral approach**. Nine subjects had the procedure done on both sides of posterior maxilla bringing the sample size of this procedure to **55**. All the subjects had Crestal Bone height of <4.0 mm, with mean crestal bone height of 2.5 mm.



### 2. ALTERNATIVE APPROACH

The graph below shows three different measurements taken from **32 subjects** before and after placement of a surgical implant in the posterior maxilla using an **alternative approach discussed in this study**. Nine subjects had the procedure done on both sides of posterior maxilla bringing the sample size of this procedure to **41**. All the subjects had Crestal Bone height of <4.0 mm with mean crestal bone height of 2.27 mm.

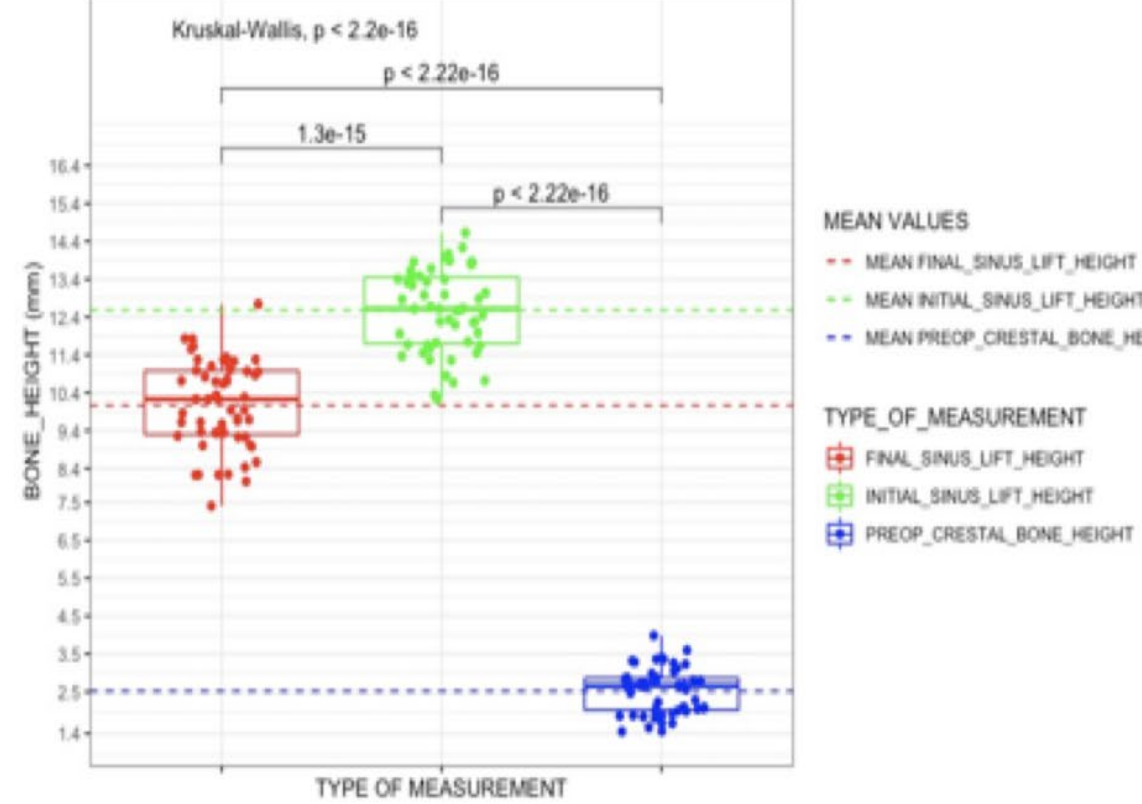


The statistical analysis conducted for this study verified the effectiveness of both the Lateral Approach and Alternative Approach procedures for Sinus Augmentation. Both procedures increased the mean Crestal Bone height by placing a graft in the sinus and elevating the sinus floor.

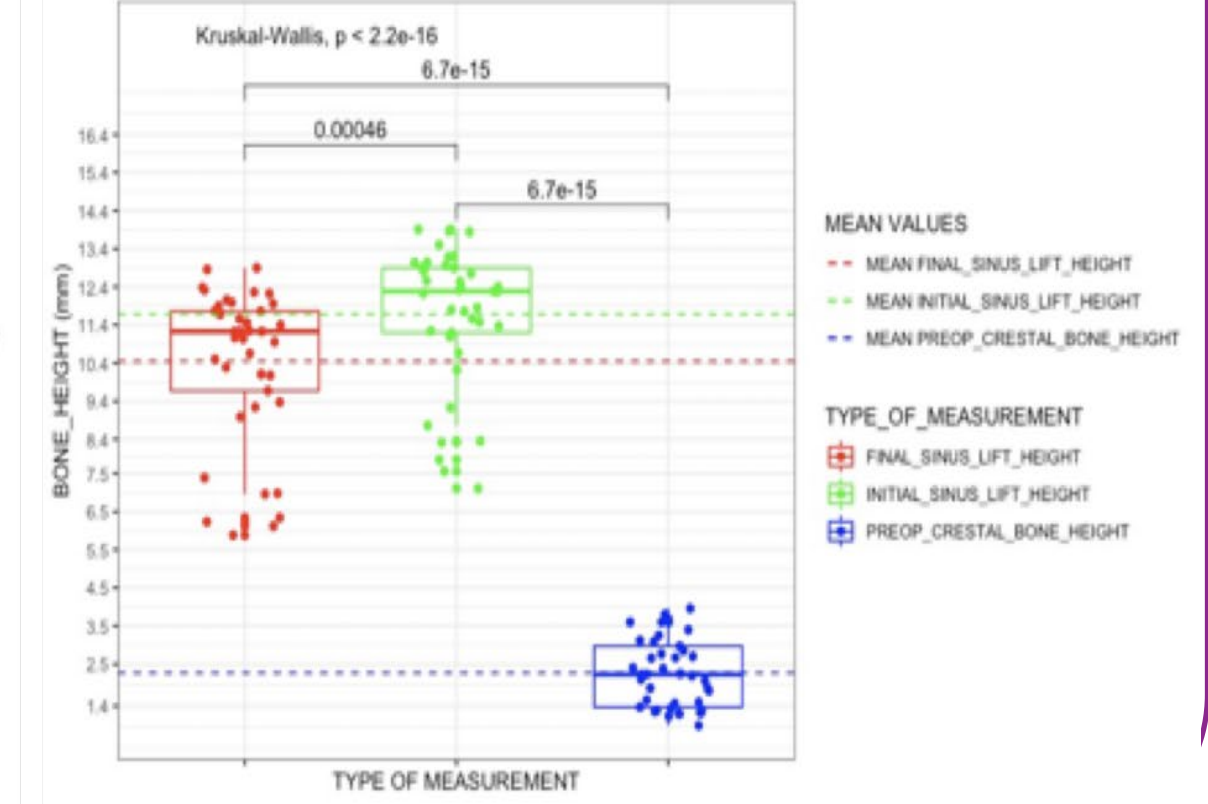
The study also compared the two procedures to determine if one was more effective than the other. The results suggest that the Alternative Approach yielded a slightly greater mean Final Sinus Lift Height compared to the Lateral Approach.

Additionally, a comparison was made between the Preop Crestal Bone Height of patients who underwent either procedure. It was concluded that the mean Preop Crestal Bone Height from both procedures was the same, indicating no significant difference in initial conditions between the two patient groups.

### DISTRIBUTION OF MEASUREMENTS (LATERAL APPROACH)



### DISTRIBUTION OF MEASUREMENTS (ALTERNATIVE APPROACH)



## CONCLUSION

The ALSAC technique, although moderately technique sensitive, is a safe, reliable and successful surgical procedure, provided that the fundamental principles of the technique are followed. The risks, trauma, and complications with this technique are less and the resulting bone height is more with ALSAC compared to the traditional lateral approach. There are some minor postoperative complications amenable to treatment through medication and / or surgical interventions. Further work maybe required to make the procedure more predictable.

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