

Surgical and Prosthetic Rehabilitation of Siblings with Witkop's Tooth and Nail Syndrome Using Zygomatic Implants: A Familial Case Series of Three Patients with up to 15-year Follow-up

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AIM

This familial case series follows three siblings with varying degrees of **Witkop Tooth and Nail Syndrome (TNS)** who underwent comprehensive oral reconstruction and prosthetic rehabilitation using zygomatic implants.

BACKGROUND

Witkop TNS is a rare, autosomal dominant form of **ectodermal dysplasia** with *common dental manifestations*:

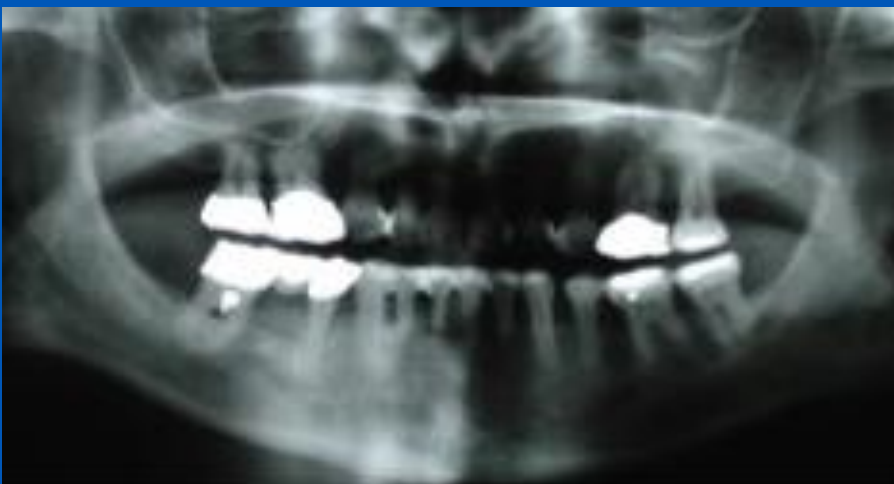
- Hypodontia involving missing primary and permanent dentition
- Hypoplastic and malformed teeth
- Severely atrophic maxillae

To provide dentoalveolar reconstruction and rehabilitation, **zygomatic implants**, in combination with *endosteal fixtures*, can offer a predictable and long-term source of prosthetic support in patients with this rare condition.

CASE SERIES

The three patients are siblings with Wiktop TNS who underwent ***full mouth implant-based reconstruction and rehabilitation***.

Case 1: 52-year-old female with heavily restored dentition and generalized periodontal bone loss resulting in unfavorable crown-to-root ratios. Five mandibular and four maxillary implants and two zygomatic implants were placed.



1. Pretreatment panoramic radiograph



2. Panoramic radiograph at 3-year follow-up



3. Panoramic radiograph at 8-year follow-up



4. Panoramic radiograph at 15-year follow-up

Case 2: 57-year-old female with extensive prosthetic and restorative rehabilitation already completed. She presented with chronic periodontal disease with Class 2 and 3 tooth mobility and generalized shortened root structure with unfavorable crown-to-root ratios. Six mandibular and four maxillary endosseous implants with two zygomatic implants.



1. Pretreatment panoramic radiograph



2. Panoramic radiograph after maxillary implant uncover



3. Panoramic radiograph after insertion of maxillary and mandibular implant-support prosthetics



4. Panoramic radiograph at 5-year follow-up

Case 3: 65-year-old male with a medical history significant for multiple myeloma with previous bone marrow transplant. He had failing maxillary implants due to periimplantitis. Mandibular dentition was compromised with significantly shortened roots and class 2-3 mobility. The patient underwent bilateral zygomatic implants, new endosseous implants distributed in the maxilla, and five new endosseous implants placed in the mandible. The previously placed implant at site #20 was preserved to help support the definitive prosthesis.



1. Pretreatment panoramic radiograph



2. Post-operative panoramic with implant reconstruction



3. Panoramic radiograph with interim maxillary and definitive mandibular prostheses



4. Panoramic radiograph with definitive maxillary prosthesis

DISCUSSION

Biological complications such as osseointegration failure or mechanical/prosthetic complications can be encountered and should be thoughtfully managed. Appropriate planning can also be considered for adequate prosthetic support, either by additional endosseous implants placed in the anterior maxilla or additional zygomatic implants.

The advantages of using zygoma implants in these cases include minimizing the need for pre-prosthetic surgeries, decreasing the overall treatment period, and limiting morbidity to the patient by reducing the number of procedures.

CONCLUSIONS

For patients with Witkop Syndrome, ***zygomatic implants with an implant-supported prosthetic rehabilitation*** are a viable and predictable treatment alternative to address *severe maxillary atrophy* and *poor-quality dentition*

REFERENCES

Branemark, P. I. (1998). Surgery and fixture installation: zygomaticus fixture clinical procedures, vol. 1. Nobel Biocare, Goteborg, Sweden.

Bedrossian E, Stumpel L 3rd, Beckley ML, Indresano T. (2002). The zygomatic implant: preliminary data on treatment of severely resorbed maxillae. A clinical report. Int J Oral Maxillofac Implants. Nov-Dec;17(6):861-5.

Peñarocha-Diogo M, Uribe-Origone R, Rambla-Ferrer J, et al: Fixed rehabilitation of a patient with hypohidrotic ectodermal dysplasia using zygomatic implants. Oral Surg Oral Med Oral Pathol Oral Radiol Endod 98:161, 20048.

Goiato MC, Pellizzer EP, Moreno A, Gennari-Filho H, dos Santos DM, Santiago JF Jr, dos Santos EG. (2014). Implants in the zygomatic bone for maxillary prosthetic rehabilitation: a systematic review. Int J Oral Maxillofac Surg. Jun;43(6):748-57

McMillan, K. B., McMillan, D. C., Arce, K., & Salinas, T. J. (2022). Surgical and prosthetic rehabilitation of siblings with Witkop tooth and nail syndrome using zygomatic implants: a familial case series of 3 patients with up to 15-year follow-up. Oral and maxillofacial surgery, 2022 Jul 30.