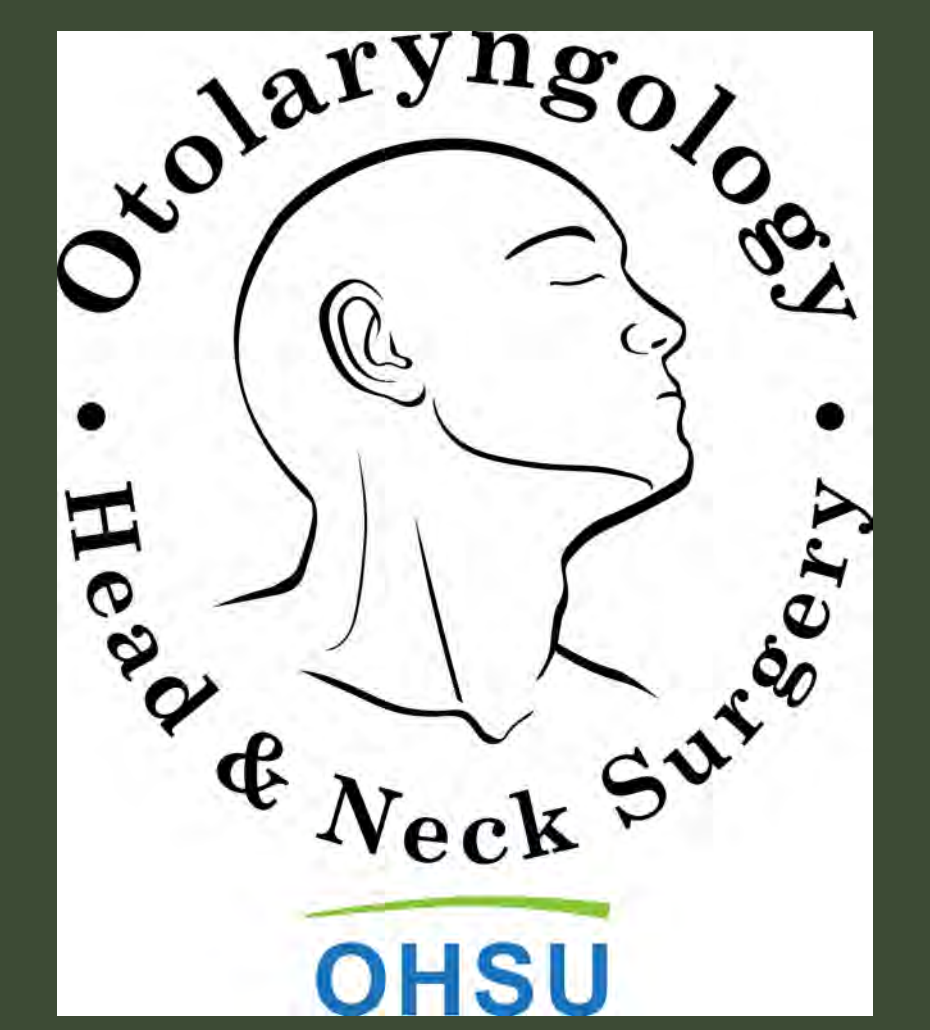




# Outcomes of Free Flap Reconstruction Following Acute Invasive Fungal Sinusitis

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## Objective

To examine outcomes in patients undergoing secondary free flap reconstruction following surgical treatment of acute invasive fungal sinusitis. The ablation involved composite defects of the cranio-facial structure. The series presented characterizes indications for reconstruction, Types of tissue used and functional outcomes.

## Background

Acute invasive fungal sinusitis (AIFS) is an infective, invasive disease with a reported mortality of up to 68%.<sup>1-4</sup> This Infection is rare, and occurs in immuno-compromised individuals. Medical therapy alone is inadequate in halting such infections. Aggressive surgical debridement is an essential component of AIFS management and the foundation of current treatment algorithms.<sup>5-7</sup> Resulting mid-face defects such as maxillectomy are composite and nature and often debilitating. Functional improvements after free flap reconstruction of mid-face defects have been demonstrated following tumor resection,<sup>9</sup> however no studies to date have characterized the outcomes of free flap reconstruction in survivors of invasive fungal sinusitis. We review our experience with patients who underwent secondary free tissue reconstruction for their defects.

## Design and Methods

- Retrospective chart review of patients treated for AIFS 1995-2015 using current procedural terminology (CPT) codes, microvascular reconstruction database records, and operative notes.
- Patient age, sex, underlying cause of immunosuppression, interval from debridement to reconstruction, and defect description were recorded.
- Maxillectomy defects were categorized as medial, subtotal or total, with or without orbital exenteration (classified according to Brown et al. [ref]).
- Indications for free flap reconstruction, (ie. oronasal regurgitation, compromised speech, effect on mastication etc,) were noted. Donor site, flap type, operative and perioperative complications were recorded.
- Indications for revision surgery, duration of follow-up, disease-free survival and overall survival using medical records and the social security death index (SSDI) were noted.

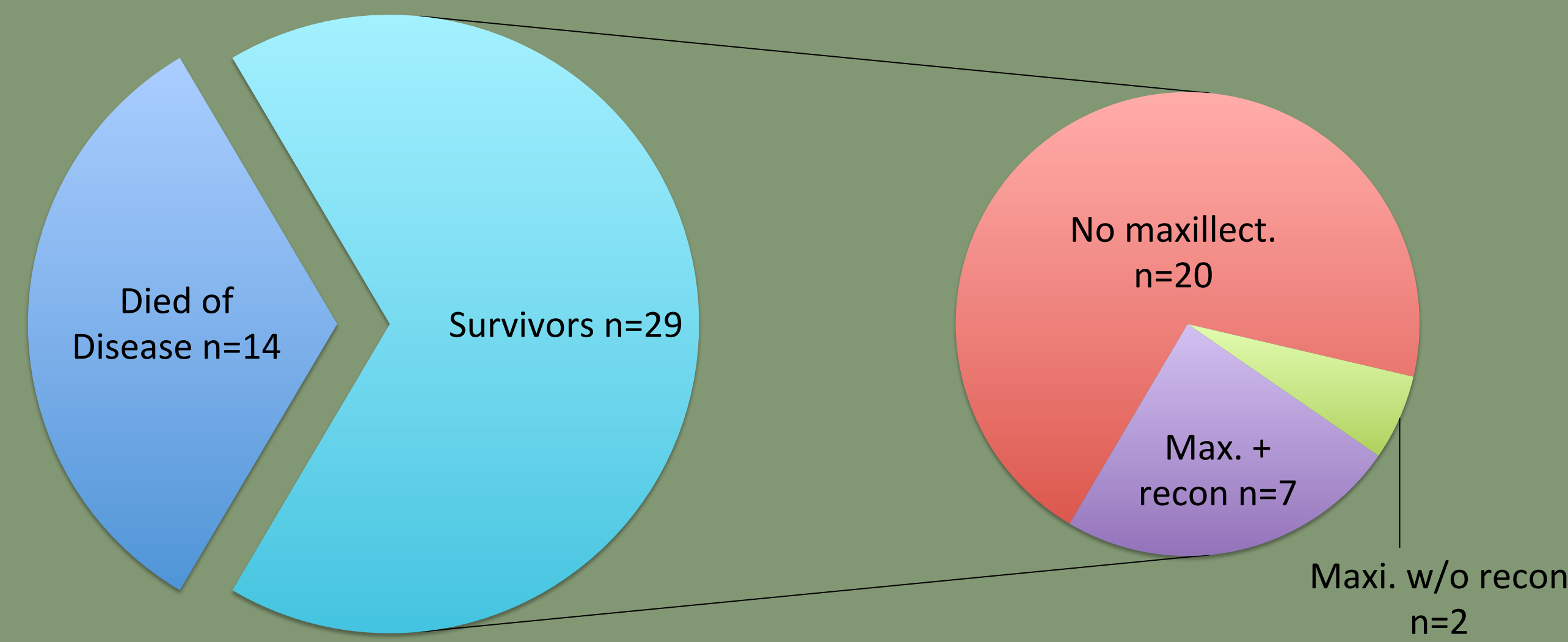


Table 1. Individual Outcomes

Sex/ Age (y)	Immune Suppression	Maxillectomy Defect	Class	Interval (d)	Tissue	Donor site	Complications	Survival (mo.)	Disease Status
M/46	DM	Medial*	I	26	MC	Rectus Abd.	Flap debulking	39	Alive/NED
F/40	DM	Subtotal	II	73	OC	RFFF	None	2	Alive/NED
M/52	DM	Subtotal	III	90	O	Scapula	None	124	Alive/NED
F/41	Lymphoma	Subtotal**	IV	14	FC	ALT	None	3	Alive/NED
M/40	DM	Total**	V	62	MC	Latissimus dorsi	None	24	Alive/NED
M/50	DM	Subtotal**	V	134	FC	RFFF	Partial Dehiscence	42	Alive/NED
F/41	DM	Total**	V	18	FC, O	ALT, scapula	None	1	Died/NED

\*\*Orbital exenteration + oronasal defect \*orbital exenteration. MC = myocutaneous. FC = fasciocutaneous. OC = osteocutaneous. O = osseous. NED = No evidence of disease. Classification adapted from Brown et al: I—orbitonasal defect with palate preservation; II—ornasal fistula/palate without orbit involvement; III—palate/orbital adnexae with orbital retention; IV—palate with orbital exenteration; V—palate with orbitomaxillary defect.

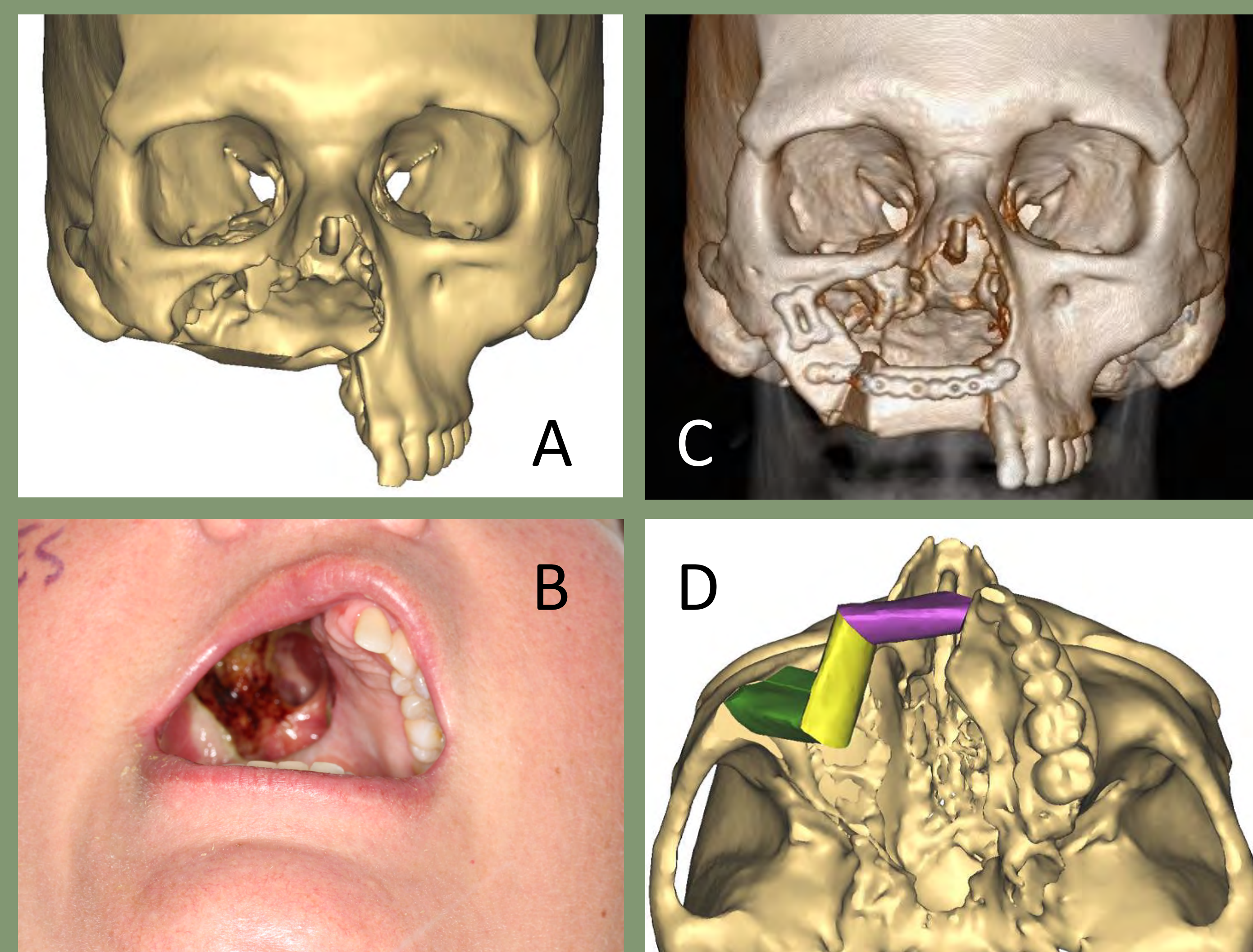


Figure 1. Maxillectomy defect before (A,B) and after (C,D) planned composite reconstruction .

## Results

- 43 patients admitted for AIFS, 29 (67%) survived acute infection.
- 9 survivors (31%) had maxillectomy defects and were candidates for free-tissue reconstruction once there was no further evidence of infection. 7 patients reconstructed (4 males and 3 females)
- Median age 41 years (range 40-52 years).
- Reconstruction indications included oronasal and/or oromaxillary defects affecting speech, deglutition and mastication in all cases.
- Immune deficiency attributed to diabetes mellitus in 6 cases (86%) and lymphoma in one case (14%). (Table 1).
- Defects included medial (1), subtotal (3) and total (3) maxillectomy, and orbital exenteration (5) (70%). In 6 cases (86%), defects extended to the palate, and were obturated with prosthetics prior to reconstruction.
- Amphotericin B in all cases, rigorous glucose control, lymphoma with chemotherapy cessation in acute management. Median interval from debridement to reconstruction 62 days (range 14-134 days).
- Facial artery and vein were used for all anastomoses.
- No perioperative medical or flap complications encountered.
- Median followup 6.5 months (range 0.7-24.5 months). No recurrent invasive fungal disease following reconstruction.
- 6/7 patients alive currently (1 unrelated death), with intact mastication, deglutition, and speech without prosthetic obturation. Median overall survival 38 months (range 2-128 months).

## Conclusion

Reconstruction of defects left by invasive fungal sinusitis using free-tissue transfer resulted in successful flap survival with no disease recurrence for all defects and flap types reviewed. Survivors of AIFS are able to tolerate midface reconstruction with favorable functional outcomes and survival rates.

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