

# Rebuilding a Jaw in a Day: Evolution and Advances in Reconstructive Surgery

Dr Simra Azher, OMFS Registrar (Barwon), MD (4th year Deakin Medical Student), DDS, Bbiomed  
 Mr Felix Sim, Consultant OMF surgeon, BDS(Hons), MBBS, MFDS(Eng), FRACDS(OMS)  
 Mr Amish Patel, Consultant OMF surgeon, BDS, MBBS, MFDS(Eng), FRACDS(OMS)



## INTRODUCTION

Jaw in a day (JIAD) represents a pioneering approach to maxillofacial reconstruction. It involves a digitally-planned, outcome-focused process that includes pathology resection, microvascular fibula free flap (MFFF) reconstruction, primary dental implant placement, and implant-supported prosthetic rehabilitation — all completed in a single day. The precise positioning of teeth is achieved through a digitally-planned, custom-made dental prosthesis, which guides the positioning of the harvested MFFF. This approach enhances the predictability of bone and dental reconstruction compared to conventional free-hand surgery. First described by Levine and colleagues in 2013 in New York, USA, JIAD has now been introduced in Australia.<sup>1</sup>

This innovative intervention is designed to enhance the patient's quality of life through timely restoration of the anatomy and function of maxillofacial structures:<sup>2</sup>



## OBJECTIVE

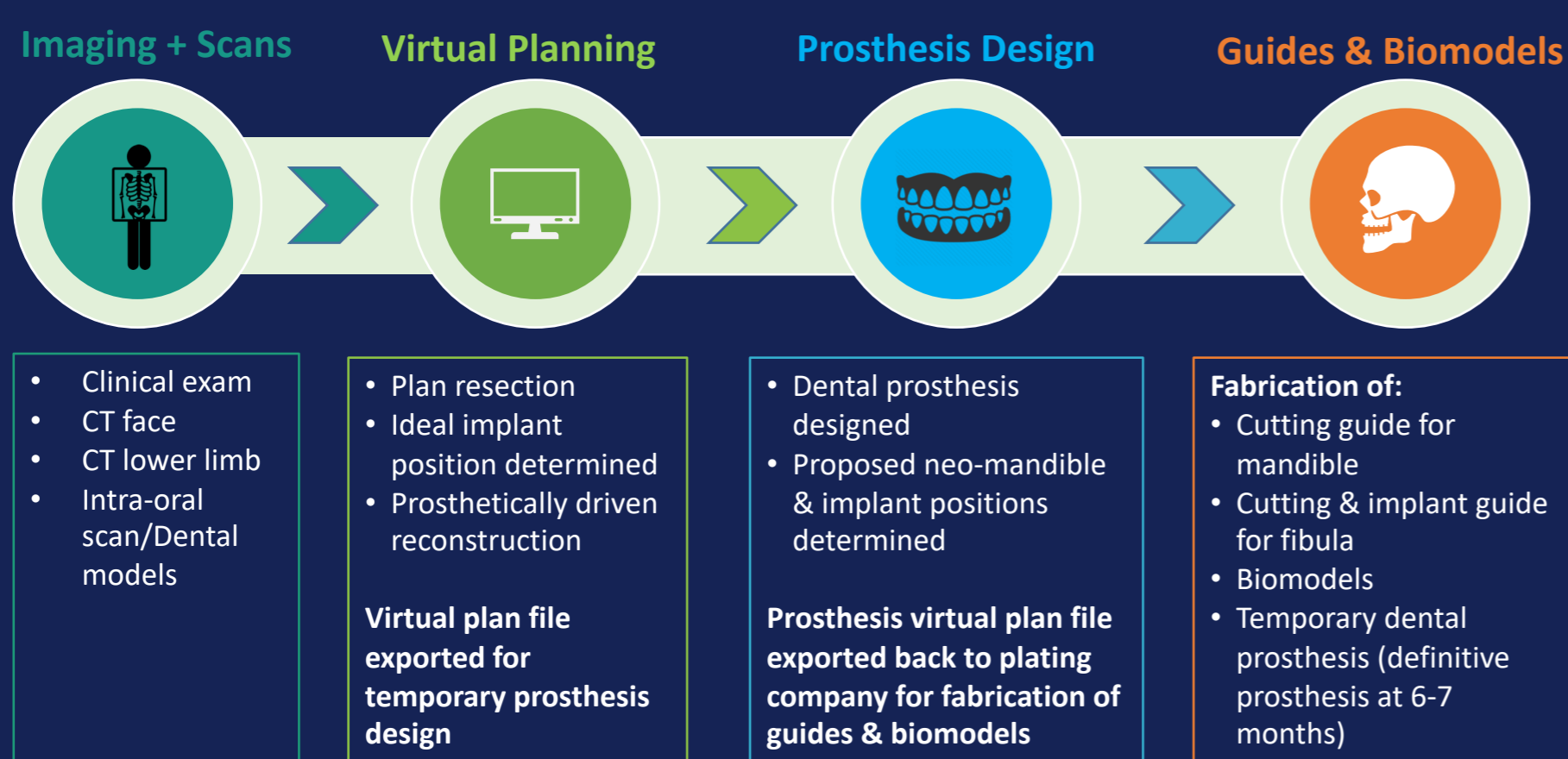
To present the Australian surgical workflow and clinical outcomes of a novel maxillofacial reconstruction approach.

## METHOD

This clinical audit presents a descriptive analysis of a total of 7 JIAD cases performed in Australia to date, including:

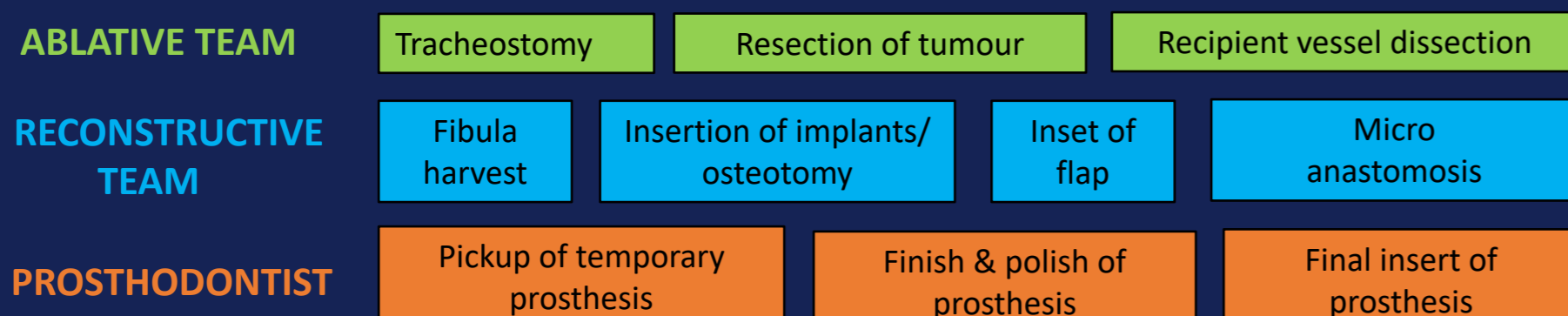
- Australian surgical workflow
- Population demographics
- Operative characteristics
- Post-operative outcomes

## Planning workflow



## Intraoperative workflow

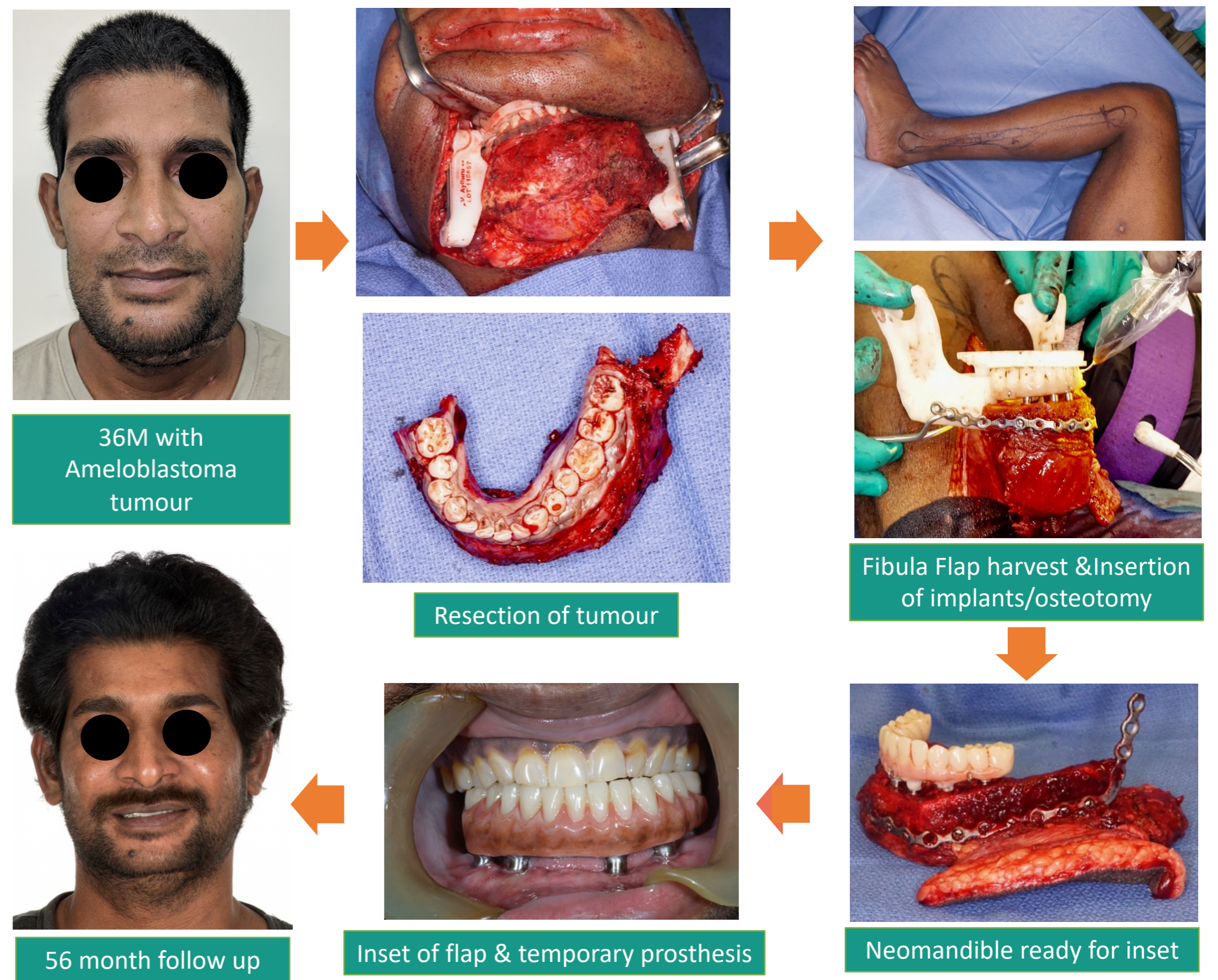
### THREE TEAM APPROACH



## REFERENCES & ACKNOWLEDGEMENTS

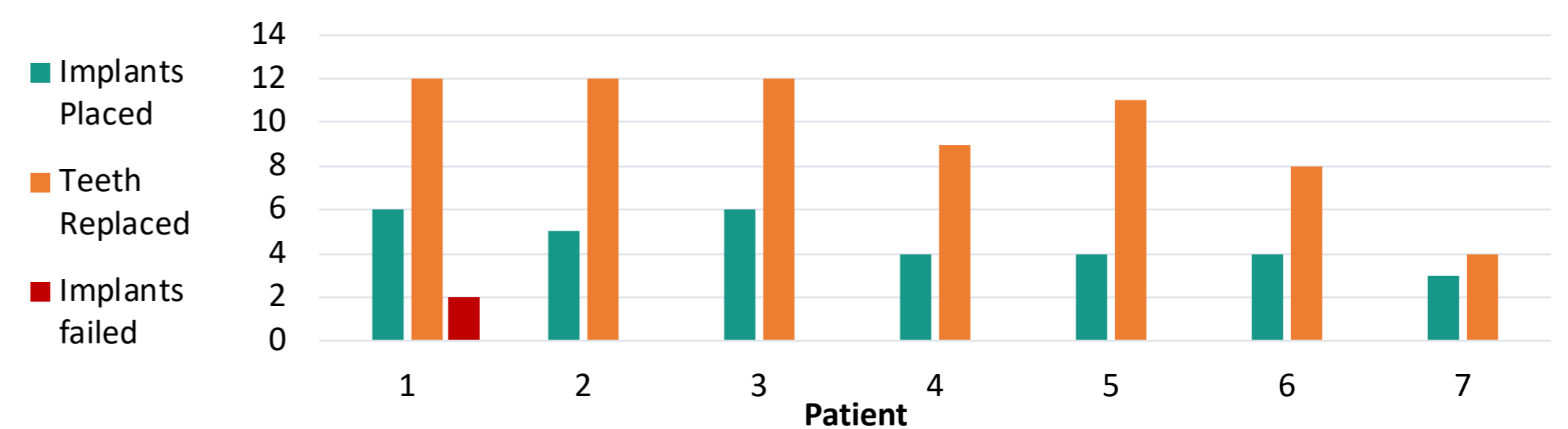
1. Levine JP, Bae JS, Soares M, et al. Jaw in a day: total maxillofacial reconstruction using digital technology. *Plast Reconstr Surg.* 2013;131(6):1386-1391.
  2. Zhang L, Ding Q, Liu C, Sun Y, Xie Q, Zhou Y. Survival, Function, and Complications of Oral Implants Placed in Bone Flaps in Jaw Rehabilitation: A Systematic Review. *Int J Prosthodont.* 2016;29(2):115-125.
  3. Moraschini V, Poubel LA, Ferreira VF, Barboza Edos S. Evaluation of survival and success rates of dental implants reported in longitudinal studies with a follow-up period of at least 10 years: a systematic review. *Int J Oral Maxillofac Surg.* 2015;44(3):377-88.
- We would like to acknowledge Mr Fraser Gilmour and Dr Gordon Burt for their contribution to the cases. Patient has provided consent for the use of their photographs.

## Patient 1: Surgical Workflow



## RESULTS

Patient	Patient Demographics				Operative Characteristics			
	Age (Years)	Gender (M/F/other)	Follow-up (Months)	Hospital stay (days)	Pathology	Mandibular Defect	Fibula Segments	Skin paddle
1	36	M	56	15	Ameloblastoma	Angle to Angle	3	Neck (monitor)
2	33	F	41	14	Ameloblastoma	Angle to Angle	3	Neck (monitor)
3	40	M	16	11	Ameloblastoma	Angle to Angle	3	None
4	79	F	33	21	Adenocarcinoma	R) Body + Symphysis	2	Intraoral
5	27	M	35	9	Ameloblastoma	L) Body + Symphysis	2	Neck (monitor)
6	57	M	17	15	Osteoradionecrosis	R) Condyle + Body	2	Extraoral
7	31	F	8	7	Ameloblastoma	L) body and symphysis	2	None



## OUTCOME DISCUSSION

Two patients were treated at UHG, while the remaining five were treated at RMH. The average age was 43.2 (range 27-79), and the average follow-up 29.4 months (range 8-56). In total, 32 implants were placed, with each patient receiving between 3 to 6 implants in the harvested fibula. These implants supported a dental prosthesis, replacing an average of 10 teeth per patient (range 4-12).

The overall MFFF survival rate was 100%. Patient 1 had two dental implants fail, resulting in an overall implant survival rate of 93.75%, which is in line with the mean reported survival rate of 94.6% (SD 5.97%) at 20-year follow-up.<sup>3</sup> Patient 4 received post-operative radiation therapy without any adverse effects. No other complications were observed and all patients received a final dental prosthesis 6-7 months post-operatively.

## CONCLUSION & SIGNIFICANCE

JIAD is a viable alternative for maxillofacial reconstruction with the potential to preserve patient QoL through timely reconstruction and rehabilitation and improved predictability of complex reconstruction, while reducing hospital costs associated with staged treatment.