

Figure S1. Post-operative recovery of patients in groups B and C. In group B, case 5 had impaired chewing function and case 10 had tumor recurrence post-operatively. In group C, case 16 had good post-operative dental restoration. However, case 17 had post-operative infection, and both cases 18 and 19 had impaired chewing function post-operatively.



Post-operative recovery of patient cases 5 and case 10 in group B



Post-operative recovery of patient cases 16, 17, 18 and 19 in group C

Table SI. Patient information.

Case	Group	Sex	Age, years	Diagnosis	Defect site	Number of previous operations	Surgical approach
1	A	Male	35	Ameloblastoma	RB	2	Customized titanium implant
2	A	Male	21	Ameloblastoma	RB	1	Customized titanium implant
3	A	Female	26	Ameloblastoma	BS	1	Customized titanium implant
4	A	Female	50	Squamous cell carcinoma	BSS	1	Customized titanium implant
5	B	Female	24	Ameloblastoma	RBS	0	Reconstruction plate
6	B	Female	43	Osteofibroma	RBSS	2	Reconstruction plate
7	B	Male	32	Keratocystic odontogenic tumor	BR	3	Reconstruction plate
8	B	Male	55	Mandibular cyst	BR	0	Reconstruction plate
9	B	Male	18	Ameloblastoma	B	0	Reconstruction plate
10	B	Female	77	Ameloblastoma	BR	0	Reconstruction plate
11	C	Male	50	Keratocystic odontogenic tumor	CRBSS	3	Vascularized fibular osteocutaneous flap
12	C	Male	27	Ameloblastoma	BR	0	Vascularized fibular osteocutaneous flap
13	C	Male	51	Ameloblastoma	BS	0	Vascularized fibular osteocutaneous flap
14	C	Male	30	Ameloblastoma	SBR	1	Vascularized fibular osteocutaneous flap
15	C	Male	29	Ameloblastoma	RB	0	Vascularized fibular osteocutaneous flap
16	C	Female	29	Ameloblastoma	RB	0	Vascularized fibular osteocutaneous flap
17	C	Male	39	Ameloblastoma	SBR	0	Vascularized fibular osteocutaneous flap
18	C	Male	65	Ameloblastoma	BS	1	Vascularized fibular osteocutaneous flap
19	C	Female	19	Ameloblastoma	RB	0	Vascularized fibular osteocutaneous flap
20	C	Male	29	Osteofibroma	SSBR	1	Vascularized fibular osteocutaneous flap

C, condyle; mandibular ascending branch; B, mandible body; S, mandibular mental region.

Table SII. Post-operative evaluation of facial and mandibular functions.

Items	Score			
	I	II	III	IV
Facial appearance	Balanced mandibular contour symmetry	The affected side is slightly sunken or swollen when viewed from a close distance	The ipsilateral side shows obvious depression or bulging	Extremely asymmetrical with significant depression or bulging
Occulusal force and chewing	Normal occulusal force, no temporomandibular joint symptoms, chewing efficiency is >80%	Restored occulusal force, chewing efficiency is 60-80%	Restored occulusal force, chewing efficiency is 40-60%	Significantly restored occulusal force, chewing efficiency is <40%
Pain	Level 1 (None)	Level 2 (Mild)	Level 3 (Moderate)	Level 4 (Severe)
Opening mouth	Normal maximum mouth opening (≥ 3 fingers)	Mild mouth opening (2-3 fingers)	Limited mouth opening (1-2 fingers)	Severely limited mouth opening (<1 finger)
Speech	Not affected at all	Slightly difficult to talk	Difficult to talk	Very difficult to talk
Swallowing/eating	Swallow and eat normally	Can eat soft food (somewhat difficult to eat)	Semi-liquid diet (difficult)	Only liquid diet (very difficult)
Mentality	Able to socialize normally	A little difficult to socialize	Moderately difficult to socialize	Very difficult to socialize

Table SIII. Post-operative evaluation of mandibular reconstruction.

Case	Group	Operation time, min	Follow-up, months	Evaluation grade	Satisfactory feedback	Material rejection reaction	Postoperative complications
1	A	150	19	I	Satisfactory	No	No
2	A	120	14	I	Satisfactory	No	No
3	A	90	12	I	Satisfactory	No	No
4	A	160	3	II	Satisfactory	No	Mild limited mouth opening
5	B	180	15	II	Satisfactory	No	Impaired chewing function
6	B	240	21	III	Fair	No	Postoperative infection
7	B	210	18	II	Satisfactory	No	No
8	B	200	29	IV	Dissatisfactory	Yes	Titanium plate loosening and exposure
9	B	220	36	II	Satisfactory		No
10	B	150	48	III	Fair	No	Tumor recurrence or reoperation
11	C	480	21	II	Fair	No	Limited mouth opening and impaired chewing function
12	C	360	19	III	Dissatisfactory	No	Facial asymmetry
13	C	330	18	II	Satisfactory	No	Shin pain
14	C	450	18	II	Satisfactory	No	Mild limited mouth opening
15	C	375	32	IV	Satisfactory	Yes	Rejection reaction
16	C	300	41	I	Satisfactory	No	No
17	C	360	46	III	Dissatisfactory	Yes	Postoperative infection and facial asymmetry
18	C	600	35	III	Fair	No	Impaired chewing function
19	C	530	42	II	Satisfactory	No	Impaired chewing function
20	C	580	42	II	Satisfactory	No	No