

Supplementary Table 1. Patients' demographics and clinical features

Patients' case no.	Age (yr)	Sex	DM	T stage	No. of RT	Dose of RT (cGy)	Stage of necrosis	ICA involvement	Preoperative feature		Initial NSF	NSF viability	Postoperative mucosal status	Salvage operation		Final feature		Final mucosal status	ICA rupture	Survival	Follow-up period (mo)
									Foul odor	Headache				CNP	Foul odor	Headache	CNP				
1	47	F	No	3	3	19,650	Late	No	Yes	No	No	NA	Necrosis	NSF	Improved	Aggravated	Developed	Necrosis	No	Alive	64
2	51	M	Yes	4	1	7,000	Late	No	Yes	No	No	NA	Necrosis	NSF	Improved	Improved	NA	Complete	No	Alive	30
3	52	M	No	3	2	12,840	Late	No	No	No	No	NA	Necrosis	NSF	NA	Improved	NA	Complete	No	Alive	46
4	54	M	No	2	4	21,600	Late	Yes	Yes	No	No	NA	Necrosis	ALTFF	Improved	Improved	Developed	Complete	No	Alive	58
5	66	M	No	3	4	21,840	Late	No	Yes	No	No	NA	Necrosis	ALTFF	Improved	Stationary	NA	Complete	No	Dead	85
6	69	M	No	4	1	6,840	Late	No	No	Yes	No	NA	Necrosis	NSF	NA	Improved	NA	Complete	No	Alive	37
7	44	M	No	4	1	6,840	Late	Yes	No	No	No	Yes	NSF-V	NA	NA	NA	NA	Complete	No	Alive	34
8	52	M	No	4	1	6,840	Middle	Yes	Yes	No	Yes	NSF-V	Complete	NA	Improved	Improved	NA	Complete	No	Alive	52
9	53	M	No	2	2	13,000	Late	Yes	Yes	No	Yes	NSF-V	Complete	NA	Improved	Improved	NA	Complete	No	Alive	52
10	56	M	No	2	1	6,600	Late	No	Yes	No	Yes	NSF-V	Complete	NA	Improved	Improved	NA	Complete	No	Alive	8
11	57	M	No	2	2	13,000	Late	No	Yes	No	Yes	NSF-V	Complete	NA	Improved	Improved	Developed	Complete	No	Alive	24
12	64	M	No	4	1	6,840	Late	No	No	Yes	No	Yes	NSF-V	NA	N/A	Improved	NA	Complete	No	Alive	73
13	67	M	No	1	2	12,750	Middle	No	Yes	No	Yes	NSF-V	Complete	NA	Improved	Improved	NA	Complete	No	Alive	61
14	72	M	No	1	1	6,720	Late	No	Yes	No	Yes	NSF-V	Complete	NA	Improved	Improved	NA	Complete	No	Alive	17
15	81	M	No	3	1	6,840	Late	Yes	Yes	No	Yes	NSF-V	Complete	NA	Improved	Improved	NA	Complete	No	Alive	8
16	67	M	No	4	1	6,720	Late	Yes	No	Yes	Yes	NSF-V	Complete	NA	NA	Improved	Aggravated	Complete	No	Alive	9
17	38	M	No	1	2	6,750	Late	Yes	No	Yes	No	Yes	NSF-V	NA	NA	Improved	Developed	Complete	No	Alive	10
18	59	M	No	2	1	Unknown	Late	No	Yes	No	Yes	NSF-V	Complete	NA	Improved	Improved	Developed	Complete	No	Alive	6
19	61	M	No	4	1	6,840	Late	No	Yes	No	Yes	NSF-V	Complete	NA	Improved	Improved	NA	Complete	No	Alive	6
20	60	M	No	4	2	12,720	Late	No	No	Yes	No	Yes	NSF-V	NA	NA	Improved	NA	Complete	No	Alive	1
21	70	M	Yes	2	2	12,600	Late	Yes	Yes	No	Yes	NSF-U	Necrosis	ALTFF	Improved	Improved	NA	Complete	Yes	Dead	8
22	67	F	No	3	2	12,840	Late	Yes	Yes	No	Yes	NSF-U	Necrosis	NA	Improved	Improved	NA	Necrosis	No	Dead	15
23	59	F	No	4	2	12,200	Late	Yes	Yes	Yes	Yes	NSF-U	Partial	ALTFF	Improved	Improved	Improved	Partial	No	Alive	26
24	70	M	No	3	1	6,750	Late	Yes	Yes	Yes	Yes	NSF-U	Partial	NSF	Improved	Improved	Improved	Partial	Yes	Alive	36
25	72	M	No	3	1	6,600	Late	No	Yes	No	Yes	NSF-U	Partial	IT graft, MTF	Improved	Improved	NA	Complete	No	Alive	54
26	46	M	Yes	3	2	12,840	Late	Yes	Yes	Yes	Yes	NSF-U	Partial	NA	Improved	Improved	Aggravated	Partial	No	Alive	38
27	55	M	No	3	1	6,720	Late	Yes	No	No	Yes	NSF-U	Partial	NA	NA	Improved	Developed	Partial	No	Alive	5

DM, diabetes mellitus; RT, radiation therapy; ICA, internal carotid artery; CNP, cranial nerve palsy; NSF, nasoseptal flap; NA, not applicable; NSF viable subgroup; ALTFF, anterolateral thigh free flap; NSF-V, NSF-viable subgroup; NSF-U, NSF necrotic or uncovered subgroup; IT, inferior turbinate; MTF, middle turbinate flap.

Supplementary Table 2. Patients' demographics and clinical features in salvage surgery

Patients' case No.	Age (yr)	Sex	No. of RT	Dose of RT (cGy)	Initial NSF	NSF viability	Postoperative mucosal status	Salvage operation	Interval to salvage operation (mo)	Pre-salvage operation features			Improvement of features			ICA rupture	Survival	Follow-up period (mo)	
										Foul odor	Headache	CNP	Foul odor	Headache	CNP				
1	47	F	3	19,650	No	NA	Necrosis	NSF	7	Yes	Yes	No	Improved	Aggravated	Developed	Necrosis	No	Alive	64
2	51	M	1	7,000	No	NA	Necrosis	NSF	26	No	Yes	No	NA	Improved	NA	Complete	No	Alive	30
3	52	M	2	12,840	No	NA	Necrosis	NSF	7	No	Yes	No	NA	Improved	NA	Complete	No	Alive	46
4	54	M	4	21,600	No	NA	Necrosis	ALTFF (maxillary swing)	2	Yes	Yes	No	Improved	Improved	Developed	Complete	No	Alive	58
5	66	M	4	21,840	No	NA	Necrosis	ALTFF (maxillary swing)	39	Yes	Yes	No	Improved	Improved	NA	Complete	No	Dead	85
6	69	M	1	6,840	No	NA	Necrosis	NSF	1	No	Yes	No	NA	Improved	NA	Complete	No	Alive	37
21	70	M	2	12,600	Yes	NSF-U	Necrosis	ALTFF (maxillary swing)	5	No	Yes	No	NA	Improved	NA	Complete	Yes	Dead	8
23	59	F	2	12,200	Yes	NSF-U	Partial	ALTFF (transcervical)	6	No	Yes	Yes	NA	Improved	Improved	Partial	No	Alive	26
24	70	M	1	6,560	Yes	NSF-U	Partial	NSF	1	No	Yes	Yes	NA	Improved	Improved	Partial	Yes	Alive	36
25	72	M	1	6,600	Yes	NSF-U	Partial	IT graft, MTF	1	No	Yes	No	NA	Improved	NA	Complete	No	Alive	54

RT, radiation therapy; NSF, nasoseptal flap; CNP, cranial nerve palsy; ICA, internal carotid artery; NA, not applicable; ALTFF, anterolateral thigh free flap; NSF-U, nasoseptal flap necrotic or uncovered sub-group; IT, inferior turbinate; MTF, middle turbinate flap.

Supplementary Video 1. Intraoperative video clip about surgical procedure of endoscopic debridement with nasoseptal flap reconstruction procedure.