

Surgery for Salivary Gland Cancer



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Salivary Gland Neoplasms

- Extremely heterogeneous group of tumours, with many different biological and clinical behaviour.
- Accounts for approximately 3%-6% of all head and neck cancer worldwide.
- Parotid tumors are far more common
 - 100 parotid tumors for every 10 submandibular gland tumors and approximately 1 sublingual gland tumor.
 - Minor salivary gland tumors occur with approximately the same frequency as submandibular gland tumors
 - oral cavity, pharynx, or in minor salivary gland rests in the parapharyngeal space.

Bradley PJ. Classification of salivary gland neoplasms. *Adv Otorhinolaryngol.* 2016;78:1-8.

Bradley PJ, McGurk M. Incidence of salivary gland neoplasms in a defined UK population. *Br J Oral Maxillofac Surg.* 2013;51(5):399-403

. Spiro RH. Salivary neoplasms: overview of a 35-year experience with 2,807 patients. *Head Neck Surg.* 1986;8(3):177-184.

Surgery options

- Enucleation
- ECD
- Partial parotidectomy
- Adequate parotidectomy
- Conservative parotidectomy
- Superficial parotidectomy
- Total parotidectomy
- Deep parotidectomy
- Radical parotidectomy
- Extended radical parotidectomy

Surgical techniques for benign Salivary Gland Tumors

- **Enucleation** -(intracapsular dissection without nerve identification)
- **Extracapsular dissection** (juxta capsular dissection with identification of nerve)
- **Adequate parotidectomy** (excision of tumor with a rim of normal parotid tissue)
- **Superficial parotidectomy** (removal of the entire superficial lobe)

Randomized clinical trial

Randomized clinical trial comparing partial parotidectomy *versus* superficial or total parotidectomy

J.-L. Roh¹, H. S. Kim² and C. I. Park²

British Journal of Surgery 2007;

101 patients with benign SGTs

Demographics of included patients:

All benign tumors

Mean Tsize-2.7cm

92%- were in the superficial lobe

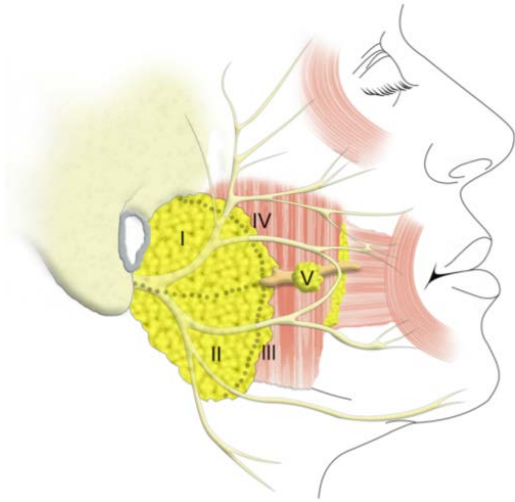
Randomised to SP (49), AP (52)

No recurrences in either groups

Significantly higher facial nerve dysfunction in the SP/TP group($p < 0.05$) than partial parotidectomy

Classification of parotidectomies: a proposal of the European Salivary Gland Society

M. Quer¹ · O. Guntinas-Lichius² · F. Marchal³ · V. Vander Poorten⁴ ·
D. Chevalier⁵ · X. León¹ · D. Eisele⁶ · P. Dulguerov³



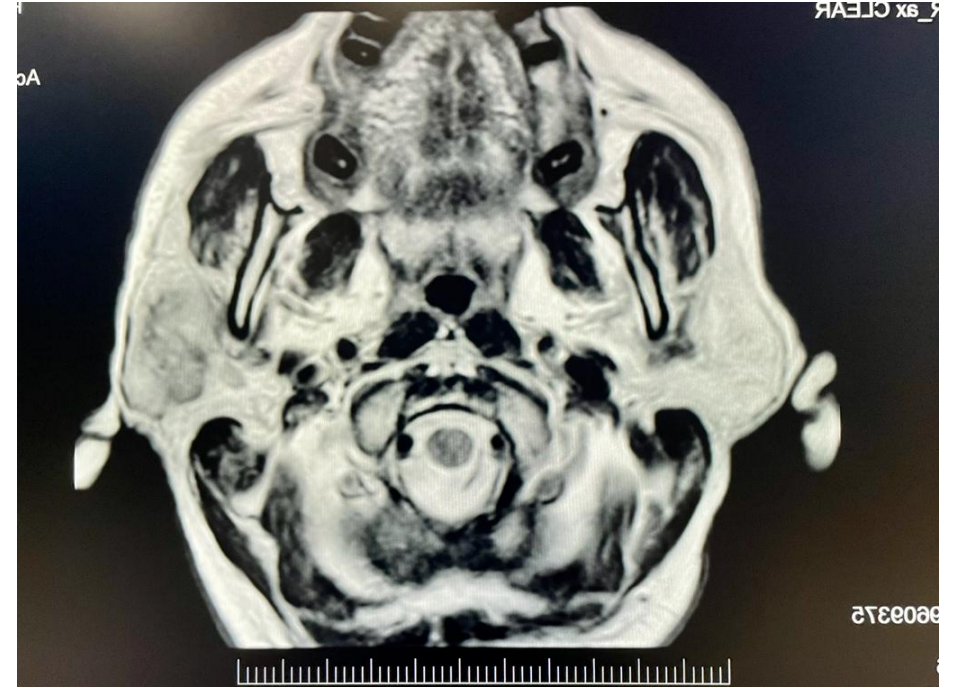
Anatomical site	Level
Superficial superior	I
Superficial inferior	II
Deep inferior	III
Deep superior	IV
Accessory	V

Table 4 ESGS definitions of resections

Term	ESGS definition
Parotidectomy	Two conditions needed Dissection of the facial nerve (at least the main trunk and one the two major divisions—temporofacialis, cervicofacialis) At least one level is removed
Extracapsular dissection (ECD)	At least one condition No facial nerve dissection performed and/or Less than one level removed

Table 6 Comparison of the new proposed classification and classical terms

ESGS proposal	Classical classifications
Parotidectomy I–IV (VII)	Total parotidectomy with facial nerve resection
Parotidectomy I–IV	Total parotidectomy with facial nerve preservation
Parotidectomy I–IV (VII, S, MM)	Extended total parotidectomy with facial nerve resection plus skin and masseter muscle resection
Parotidectomy I–II	Superficial parotidectomy
Parotidectomy III–IV	Deep lobe parotidectomy
Parotidectomy I	Partial superficial parotidectomy
Parotidectomy II	Partial superficial parotidectomy
Parotidectomy I–II–III	Superficial parotidectomy extended to the inferior deep lobe
Parotidectomy V	Accessory lobe removal
ECD I	Extracapsular dissection with tumor in level I
ECD II	Extracapsular dissection with tumor in level II
ECD V	Extracapsular dissection with tumor in level V



- 67 Yrs/F
- Swelling- 1 month
- Left eye closure weakness+
- FNA:
 - Outside-Mucoepidermoid Ca
 - TMH- High grade carcinoma

Surgery options

- Superficial parotidectomy
- Total parotidectomy
- Radical parotidectomy
- Extended radical parotidectomy

TABLE 1. Stratification of Salivary Gland Carcinomas (Based on WHO 2017)

Low Aggression	High Aggression
Acinic cell carcinoma	Adenoid cystic carcinoma Tubular/cribriform pattern predominant Solid pattern > 30%
(Mammary analogue) Secretory carcinoma	Poorly differentiated carcinoma: neuroendocrine and non-neuroendocrine Undifferentiated carcinoma Large-cell neuroendocrine carcinoma Small-cell neuroendocrine carcinoma
Mucoepidermoid carcinoma Low grade Intermediate grade	Mucoepidermoid carcinoma High grade
Polymorphous adenocarcinoma Classic Cribriform	Polymorphous adenocarcinoma High grade
Epithelial-myoepithelial carcinoma	
(Hyalinizing) Clear cell carcinoma	
Basal cell adenocarcinoma	
Sebaceous adenocarcinoma	Lymphoepithelial carcinoma
Intraductal carcinoma Low grade High grade	(Conventional) Salivary duct carcinoma
Adenocarcinoma, NOS Low grade	Adenocarcinoma, NOS High grade
Myoepithelial carcinoma	
Oncocytic carcinoma	Carcinosarcoma
Carcinoma ex pleomorphic adenoma—risk is determined by type of carcinoma and extent of invasion	

Abbreviation: NOS, not otherwise specified.

Extent Of Parotidectomy

- For Low grade and High-grade parotid lesions.

Extent of Surgery

- Superficial parotidectomy for appropriately located superficial T1 or T2 low-grade salivary gland cancers.
- Clinical behaviour of these tumors is similar to pleomorphic adenomas and other benign salivary neoplasms.

Indications for nerve monitoring



All patients undergoing parotid surgery

Or

High risk patients (redo surgery, T3T4 tumors, ACCs)

Or

Not required in any parotidectomies

Facial Nerve Monitoring during Parotidectomy: A Systematic Review and Meta-analysis

PRISMA reporting +
Strict inclusion/exclusion criteria
Tests for heterogeneity done

Amit J. Sood, MD¹, Jeffrey J. Houlton, MD^{1,2},
Shaun A. Nguyen, MD, MA¹, and M. Boyd Gillespie, MD¹

Otolaryngology–Head and Neck Surgery 152(4)

1441 articles screened, 7 studies included

Benign and malignant tumors, Superficial and Total parotidectomy

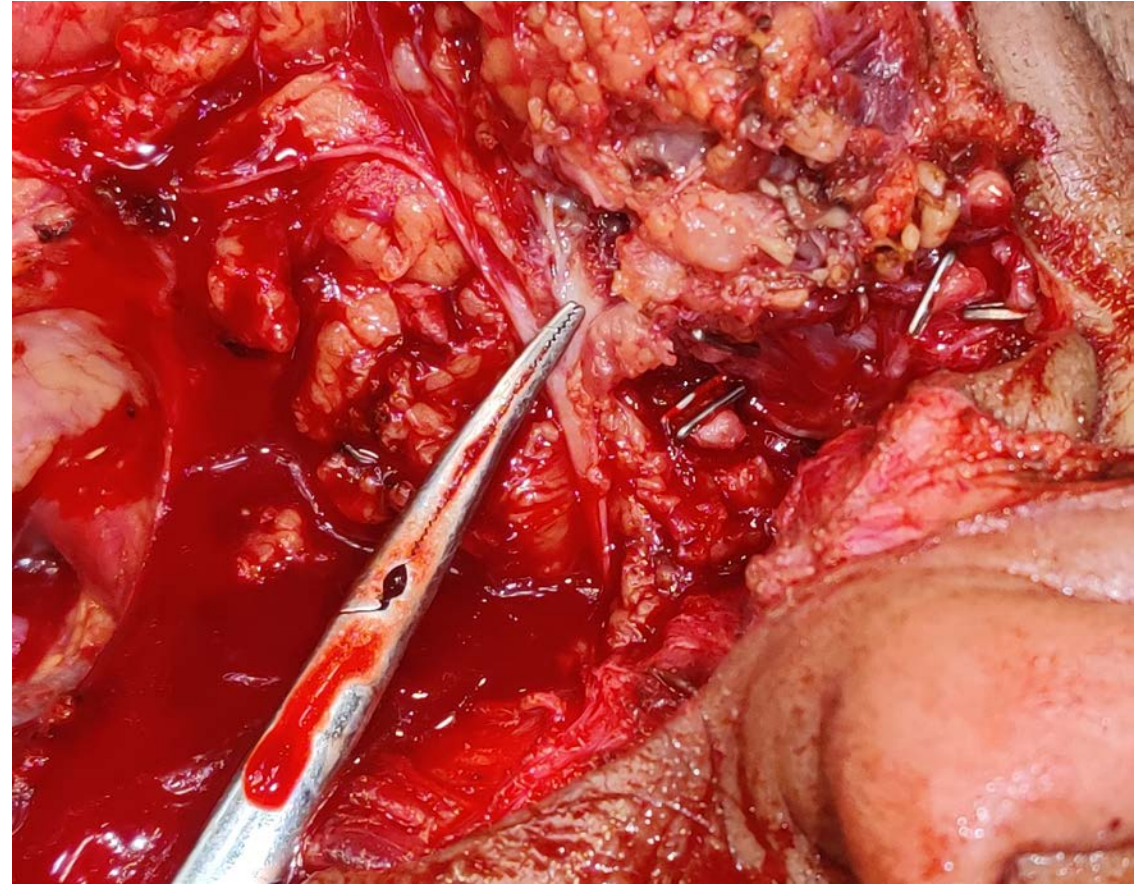
Significant difference in temporary palsy rates with FN monitoring

Non significant differences in permanent palsy rates

Absolute risk reduction of 11.7%

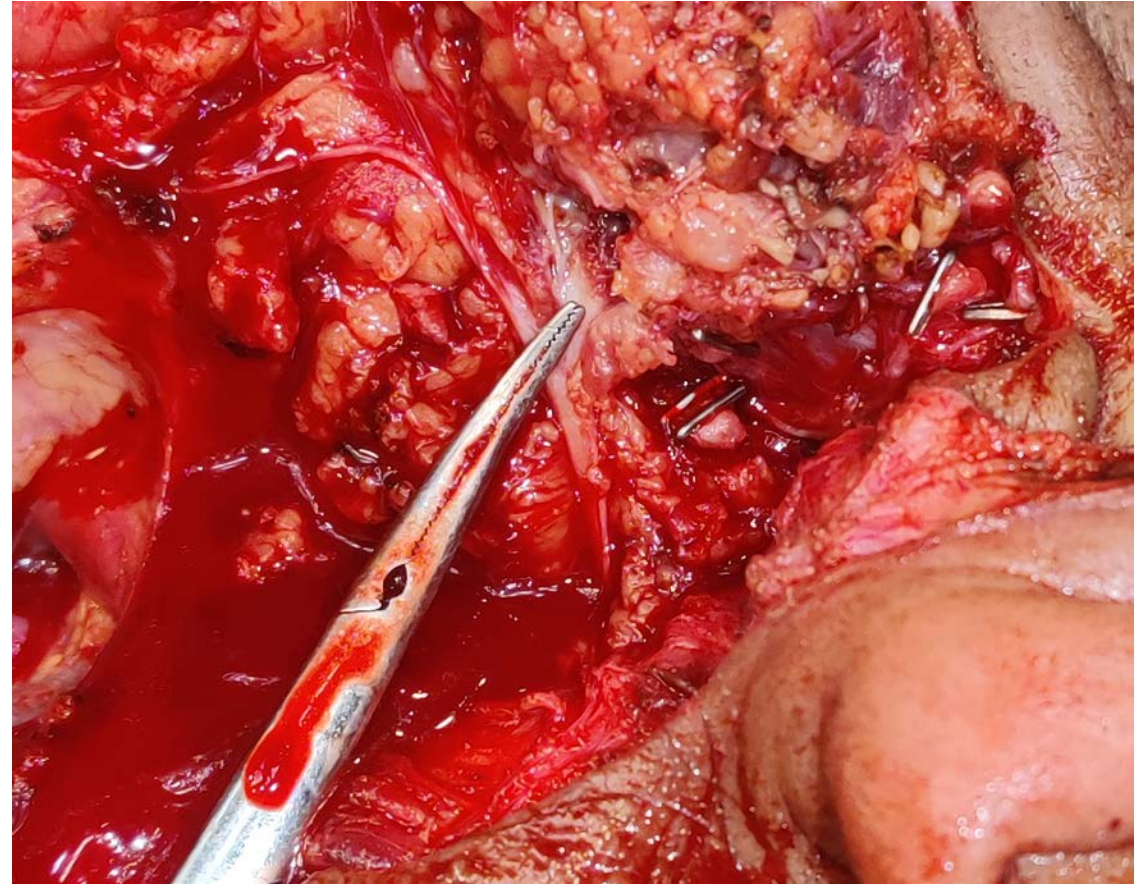
Intraoperative Frozen Section

- Do you use them?
- For what?



Intraoperative Frozen Section

- To support immediate alterations in intraoperative management (extent of resection and neck dissection)



A Systematic Review and Meta-analysis of the Diagnostic Accuracy of Frozen Section for Parotid Gland Lesions

Robert L. Schmidt, MD, PhD, MMed, MBA,¹ Jason P. Hunt, MD,² Brian J. Hall, MD,¹ Andrew R. Wilson, MStat,³ and Lester J. Layfield, MD¹

- 13 studies with 1,880 cases
- Sensitivity- **90%** specificity- **99%**

Indications of FS

- To achieve clear margins intraoperatively
- To grade the tumour for intraoperative decision making
- Decision of nerve resection or preservation
- Neck management

Facial nerve management

- IONM advisable in **high grade tumours, recurrent tumours, higher stage tumours, deep lobe tumours**
- **If preop palsy-** to consider sacrifice the nerve with intraoperative primary nerve repair
- **If pre op no palsy-** try to preserve the nerve from tumour, if not possible- resect

Facial nerve reconstruction

Early reconstruction of extratemporal lesion

- Primary direct nerve suture or interposition graft
- Upper lid weights

Early reanimation when facial nerve is not available

- XII-VII jump anastomosis
- Masseteric nerve transposition
- Cross face nerve suture

Delayed reconstruction

- Hypoglossal facial nerve jump anastomosis
- Masseteric nerve transposition
- Microvascular muscle transfer,temporalis/masseter muscle transfer

Margins

- The extent of adequate free margin is not well-established.
 - Absence of prospective randomized trials,
 - The different anatomic sites that these tumors involve,
 - The diverse histologic types,
 - The presence of the facial nerve for parotid tumors.

Margins in parotid malignancies

- No clear evidence of what is adequate margin for




TABLE III.
Association of Positive Margin Status With Overall Survival by Histologic Subtype

Histology	No. of Patients	5-Year OS by Margin Status		HR (95% CI)	P Value
		Positive	Negative		
All	5,639	79%	62%	1.34 (1.20-1.49)	<.001
Adenocarcinoma NOS	1,012	60%	45%	1.19 (0.98-1.45)	.078
Low-grade MEC	824	91%	89%	1.05 (0.60-1.83)	.874
High-grade MEC	1,706	74%	52%	1.56 (1.31-1.86)	<.001
Adenoid cystic	692	83%	71%	1.30 (0.94-1.78)	.111
Acinar cell	1,405	89%	78%	1.21 (0.90-1.63)	.204

The association of positive margin status with overall survival stratified by histologic subtype, controlling for patient, tumor, and treatment factors on multivariable Cox proportional hazards regression.

CI = confidence interval; HR = hazard ratio; MEC = mucoepidermoid carcinoma; NOS = not otherwise specified; OS = overall survival.

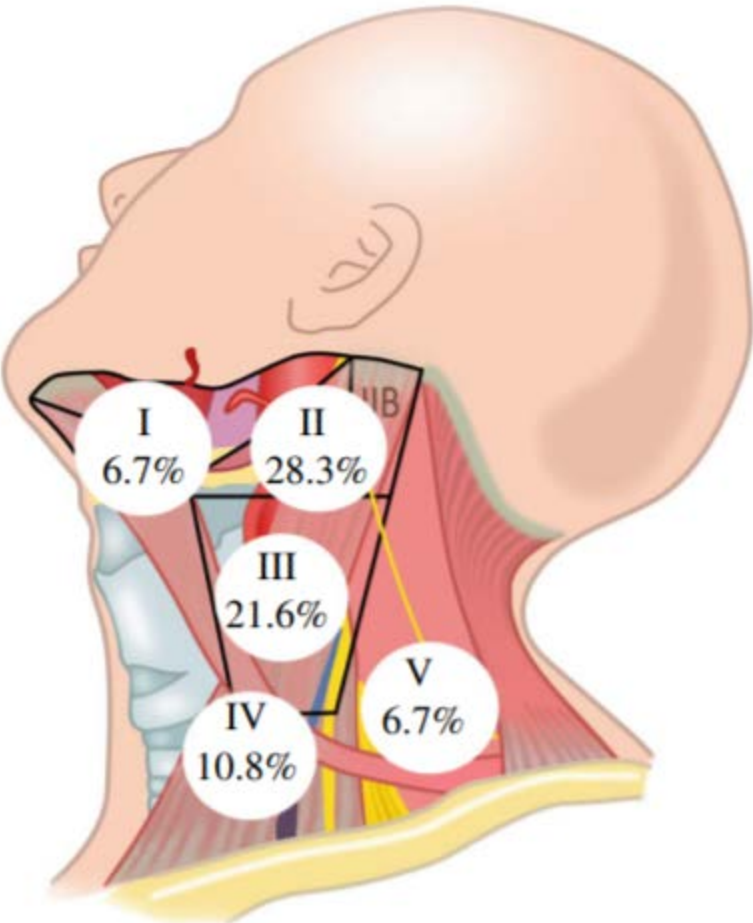
Positive Surgical Margins in Parotid Malignancies: Institutional Variation and Survival Association

Elliot Morse, BS ; Rance J. T. Fujiwara, BS ; Benjamin Judson, MD ; Manju L. Prasad, MD, MBBS;
Saral Mehra, MD, MBA

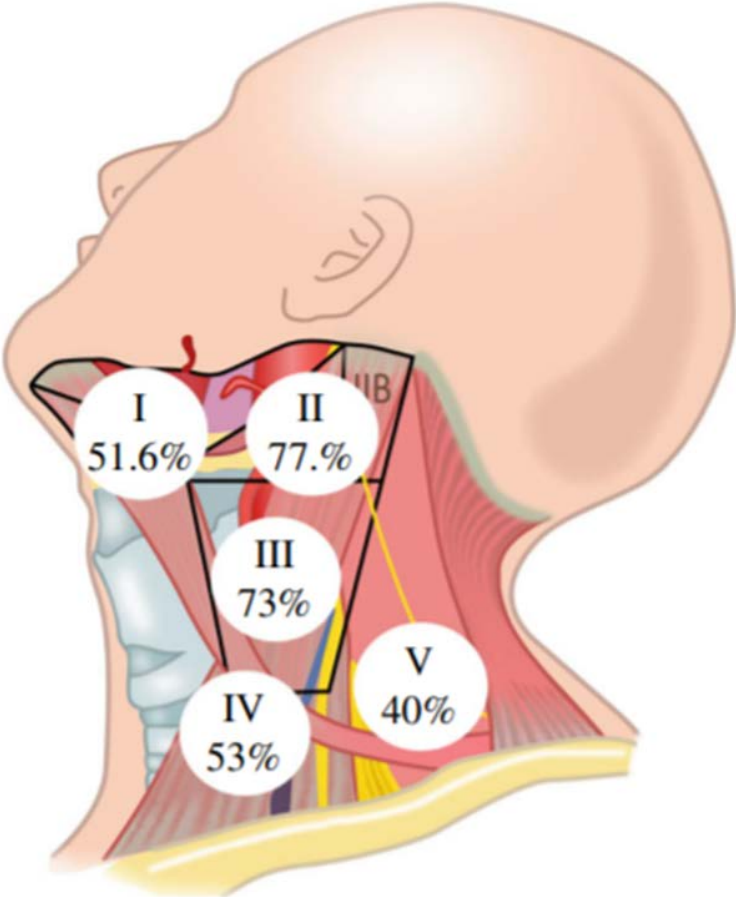
Neck Dissection

- When?
 - Clinically negative neck in T3 and T4 tumors and high-grade malignancies.
- What Levels (in cN0)?
 - For parotid malignancies, levels may include 2-4.

NODAL SPREAD PATTERN



N 0 NECK



N + NECK

Elective neck treatment

High risk	Low risk
SCC	Adenoid cystic
Adenocarcinoma	Acinic cell
High grade MEC	Low grade MEC
Carcinoma ex pleomorphic	sarcoma
Undifferentiated carcinoma	

grade	Occult nodal disease
Low grade	2%
intermediate	16%
High grade	39%

T stage	Occult nodal disease
>3cm	20%
<3cm	4%

Neck management

- **Low risk of occult nodal disease**- T1,T2 tumour,low grade-
 - wait and watch
- **High risk of occult nodal disease** - T3 AND T4,high grade tumours
 - **NO NECK** – elective neck dissection-level 2-4 or 1b to 4
 - If neck dissection is not done- Elective nodal irradiation
 - **N+ NECK**- neck dissection level 1-5

HEAD AND NECK CANCER

Regression Derived Staging Model to Predict Overall and Disease Specific Survival in Patients With Major Salivary Gland Carcinomas With Independent External Validation

Natarajan Ramalingam, MS¹; Shivakumar Thiagarajan, MS¹; Nithyanand Chidambaranathan, MS¹; Arjun Gurmeet Singh, MDS¹; Devendra Chaukar, MS¹; and Pankaj Chaturvedi, MS¹

TABLE 1. Demographic Details

Variable	SEER Database Cohort (N = 6,246)	External Validation Cohort (N = 269)
Age, years, No. (%)		
< 65	3,059 (49)	227 (84.4)
More than 65	3,187 (51)	42 (15.6)
Sex, No. (%)		
Male	3,761 (60.2)	156 (58)
Female	2,485 (39.8)	113 (42)
Primary site, No. (%)		
Parotid gland	5,245 (84)	243 (90.3)
Submandibular gland	812 (13)	25 (9.3)
Major gland NOS	189 (3)	1 (0.4)
Grade of tumor, No. (%)		
Low grade	1,101 (17.6)	99 (36.8)
Intermediate grade	2,297 (36.8)	62 (23)
High grade	2,848 (45.6)	108 (40.1)
WHO histological aggression, No. (%)		
Low aggression	2063 (33)	151 (56.1)
High aggression	4,183 (67)	118 (43.9)
AJCC stage, No. (%)		
I	1758 (28.1)	78 (29)
II	1,117 (17.9)	83 (30.9)
III	1,336 (21.4)	48 (17.8)
IVA	1,652 (26.4)	51 (19)
IVB	207 (3.3)	2 (0.7)
IVC	176 (2.8)	7 (2.6)
Histology, No. (%)		
MEC	2,343 (37.5)	108 (40.8)
Adenoidcystic carcinoma	475 (7.6)	37 (14)
SDC	217 (3.5)	30 (11.3)
MASC	26 (0.4)	10 (3.8)
EMC	136 (2.2)	26 (9.8)
Adenocarcinoma	926 (14.8)	11 (4.20)
SCC	35 (0.6)	9 (20.5)
Acinic cell carcinoma	Nil	18 (6.8)
Lymphoepithelial carcinoma	45 (0.7)	3 (1.1)
Carcinoma NOS	2043 (32.7)	13 (4.9)
Neck dissection, No. (%)		
Sampling only	1,409 (22.6)	137 (50.9)
Neck dissection done	3,171 (50.8)	113 (42)
Not done	1,666 (26.7)	19 (7.1)

Submandibular Salivary Gland Carcinoma

- Minimum a SND I-III is recommended.

To Conclude

- Superficial Parotidectomy is the minimum surgery that can be offered to parotid gland carcinoma.
- Level II sampling in N0 Neck, if positive complete the neck.
- No robust data to mandate the use of IONM routinely.
- Facial nerve management is very crucial.
- Concept of margin in parotid carcinoma is flawed.
- Frozen section has limited value in salivary carcinoma.

Thank You