# Fine Needle Aspiration Cytology - an overview

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**Dept of pathology**

# Historical perspective

- Histopathology >100 years -
- Last 50 years birth of cytopathology - mainly exfoliative cytology
- Scandinavia 1950S -1960S ; Sodestroem and Franzen in Sweden and Lopez cardozo in Holland
- Performed by ‘professional hybrids’ - clinicians who used it for rapid diagnosis

# FNAC - definition

- Aspiration of cells/ tissue fragments using fine needles ( 22 , 23, 25 G) ; external diameter  0.6 to 1.0 mm
- 1.5 inches long needle ( radiologists use longer needles)
- Diagnostic materials in the needle and not in the syringe even in cystic lesions

# Clinical skill required

- Familiarity with general anatomy eg thyroid vs other neck swelling
- Ability to take a focused clinical history
- Sharp skill in performing physical examination eg solid vs cystic, benign vs maligant lesions

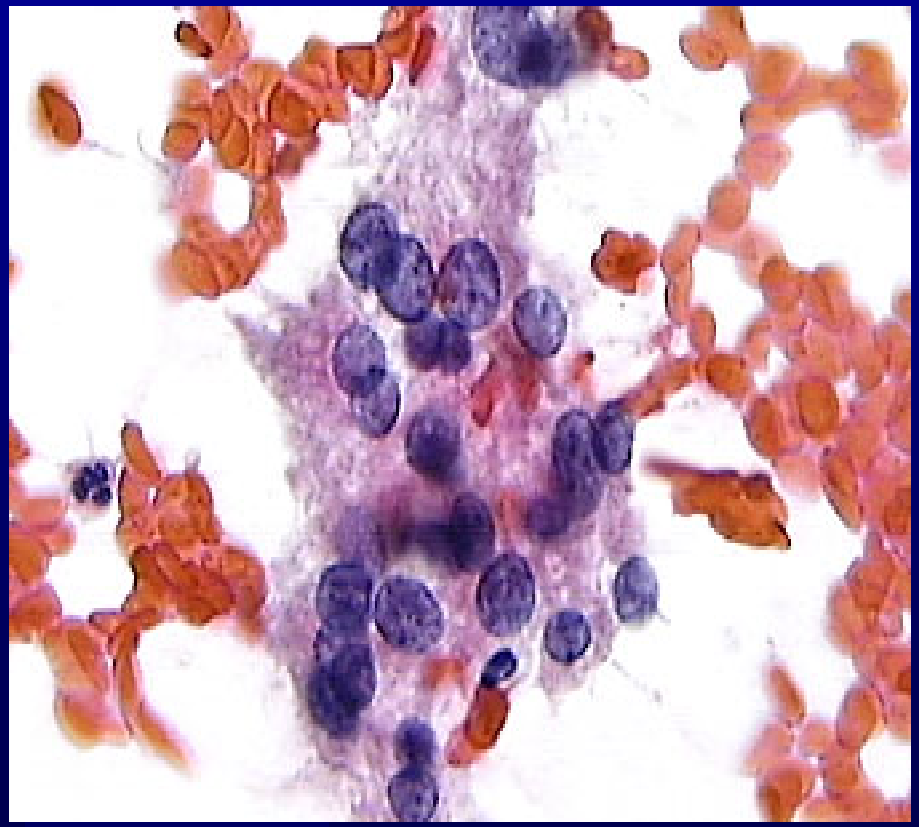
# Clinical skill required -2

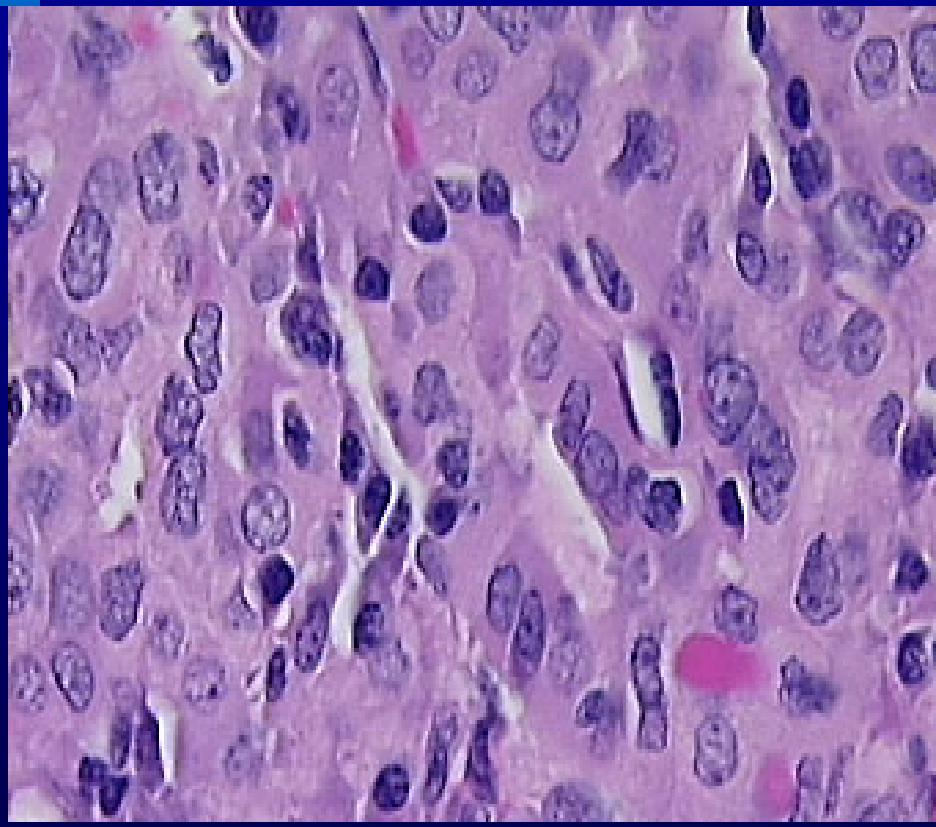
- Good knowledge in normal cellular elements from various organs and tissue and how they appear on smears eg fats cells vs breast tumour cells
- Comprehensive knowledge of surgical pathology

# Clinical skill required -3

- Ability to translate traditional tissue patterns of lesions to their appearance in smears

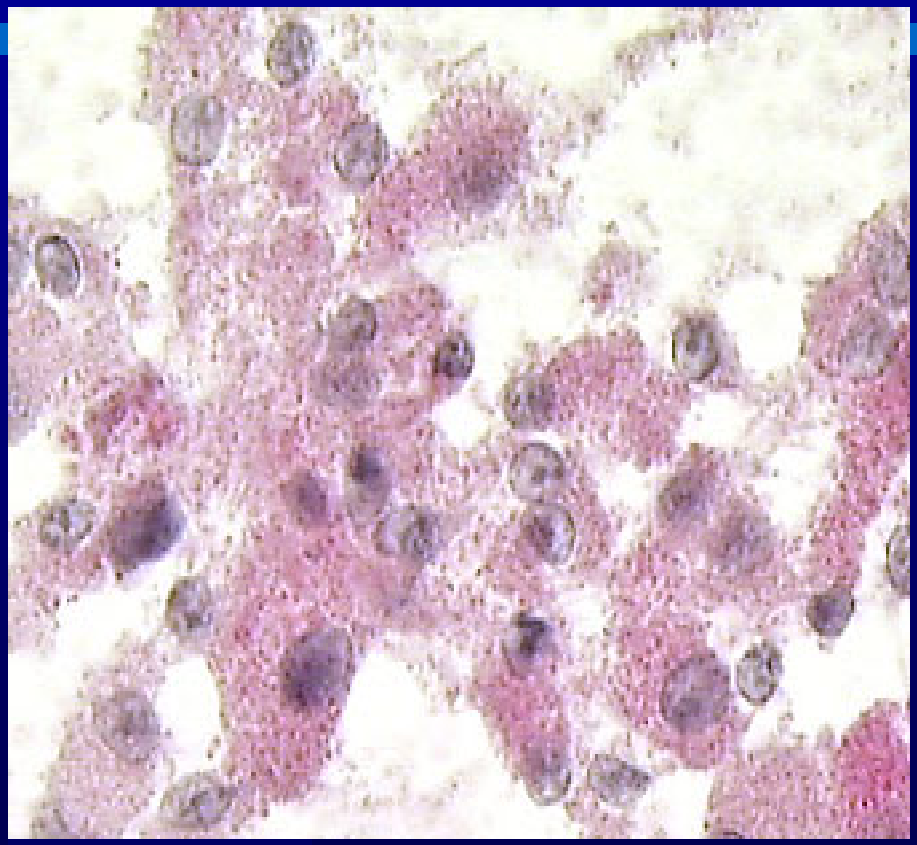
# Cytology vs Histology

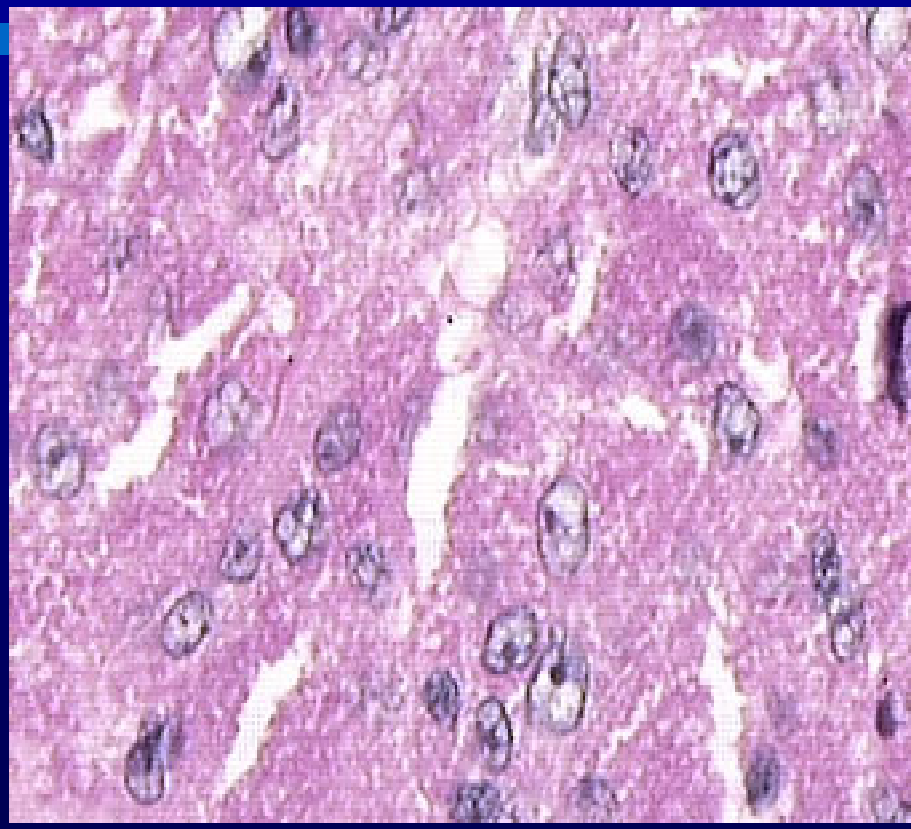




**Papillary carcinoma of thyroid - follicular variant**

# Cytology vs Histology - 2





**Granular Cell Myoblastoma**

# Who should do FNA?

- Clinicians
- Cytotechnologists
- Radiologists
- Pathologists

**The one who examines the patients , does the aspiration, makes the smears, interprets the cytology is the best one to do FNA -**

**PATHOLOGIST**

# Current status

- Palpable lesions
- Outpatients , in- patients
- Thyroid , breast, lymph nodes, salivary glands , soft tissue lumps...
- Lung, intra-abdominal and retroperitoneal by radiologic imaging : CT, ultrasound, flouroscopy

# LIMITATIONS

- Soft vs hard ( bone) lesions
- Solid vs cystic lesions
- Poor cellular yield vs poor technique
- Reactive vs specific diseases  eg reactive lymphadenitis vs Hodgkins disease
- Diffuse vs nodular lymphoma

# Complications

- Needle trauma
  - granulation tissue formation
  - granuloma formation
  - Sarcoma like changes
  - Needle linear tract haemorrhage
  - tissue necrosis

**Interfere with surgical pathology**

- Needle track seeding - testicular tm, chondrosar
- Hematoma
- Pain
- Pneumothorax???

# ADVANTAGES

- Fast - early diagnosis
- Less pain, less trauma
- No anaesthesia
- Acceptable by patients and doctors
- Accurate

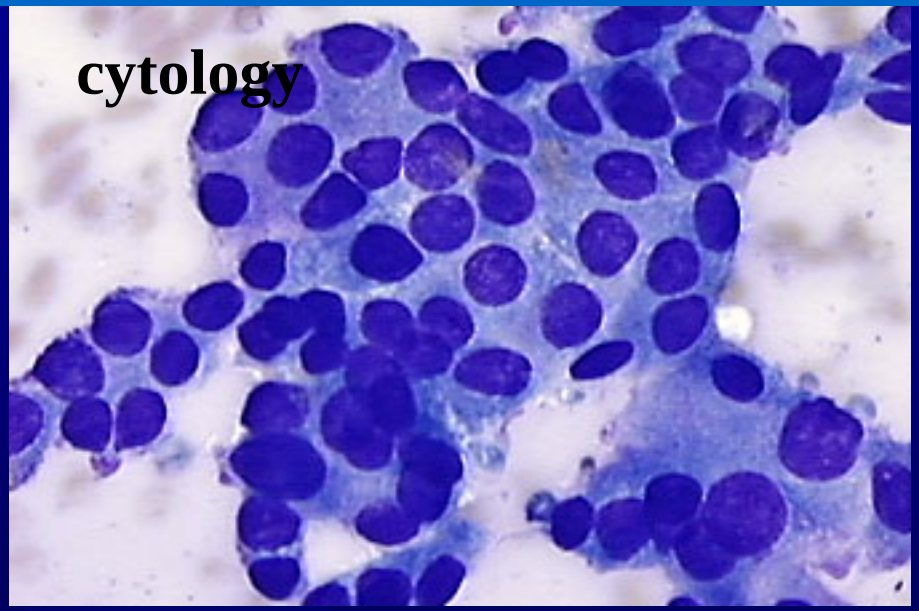
# How to interpret?

- Aspiration materials eg colloid, blood, mucus?
- Cellular yield vs acellular yield
- Smear pattern - 3 dimensional balls vs flat monolayered sheet os cells
- Cohesiveness vs discreet cells
- Cell morphometry

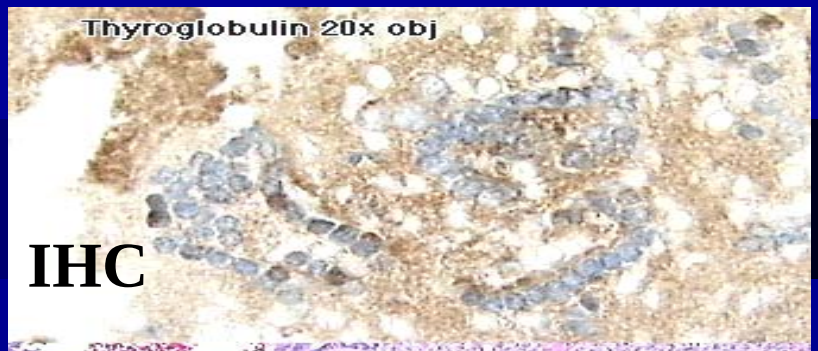
# Adjunct tools

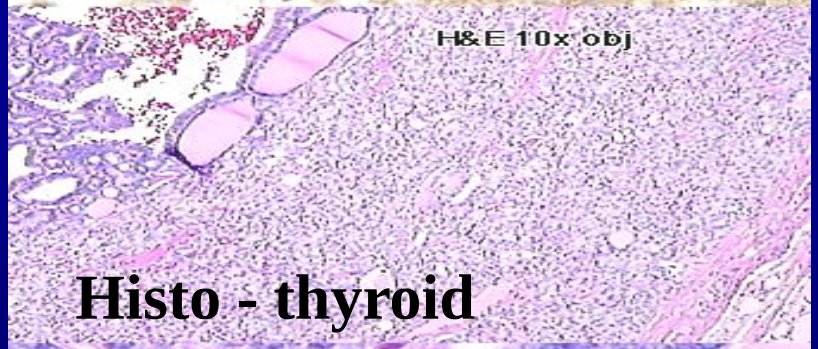
- Cell blocks
- Histochemistry
- Immunohistochemistry
- Electron microscopy
- Flow cytometry
- Immuno electron microscopy
- Molecular pathology -In situ hybridization, PCR etc

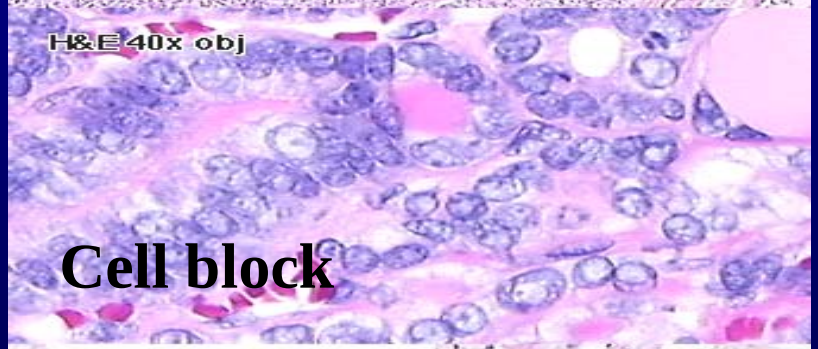
# Adjunct tools




45 yr old woman with lytic bone lesion



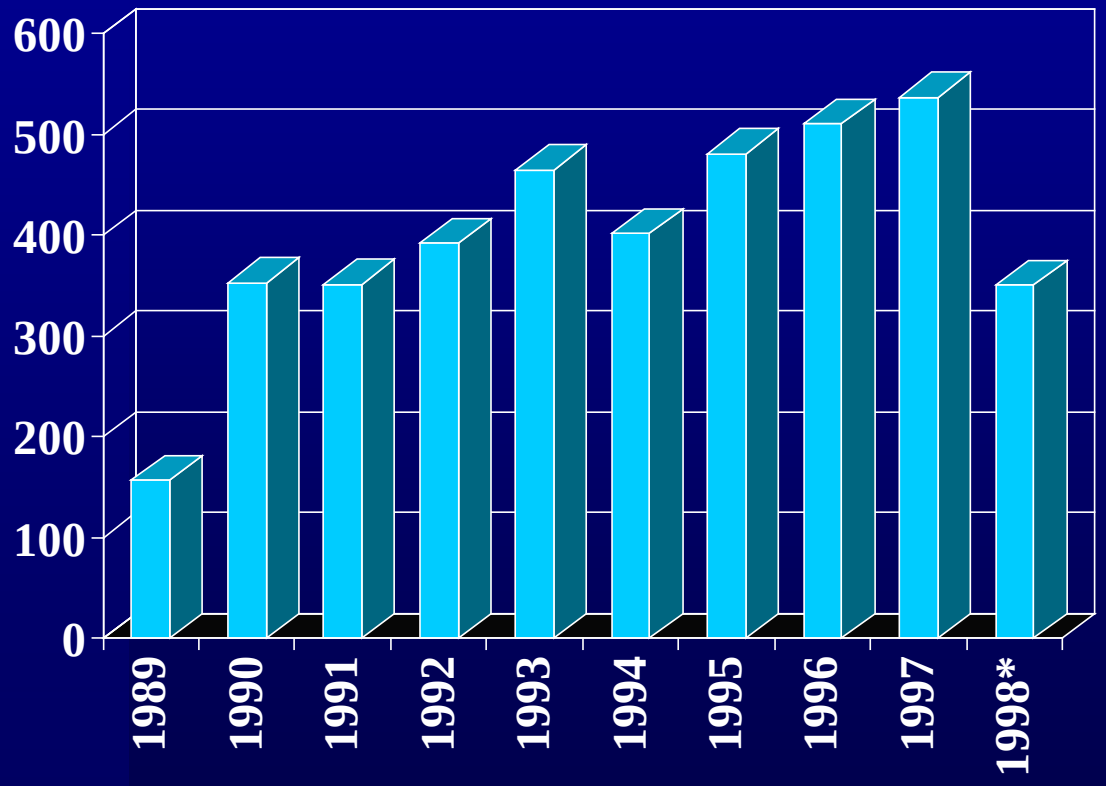




# Future directions

- Aspirating non palpable lesions using MRI
- Molecular pathology  eg In Situ Hybridization
- Replacing diagnostic surgical pathology?
- Combined with MRI - replacing autopsy?

# FNAC - USM experience
# Total cases per year

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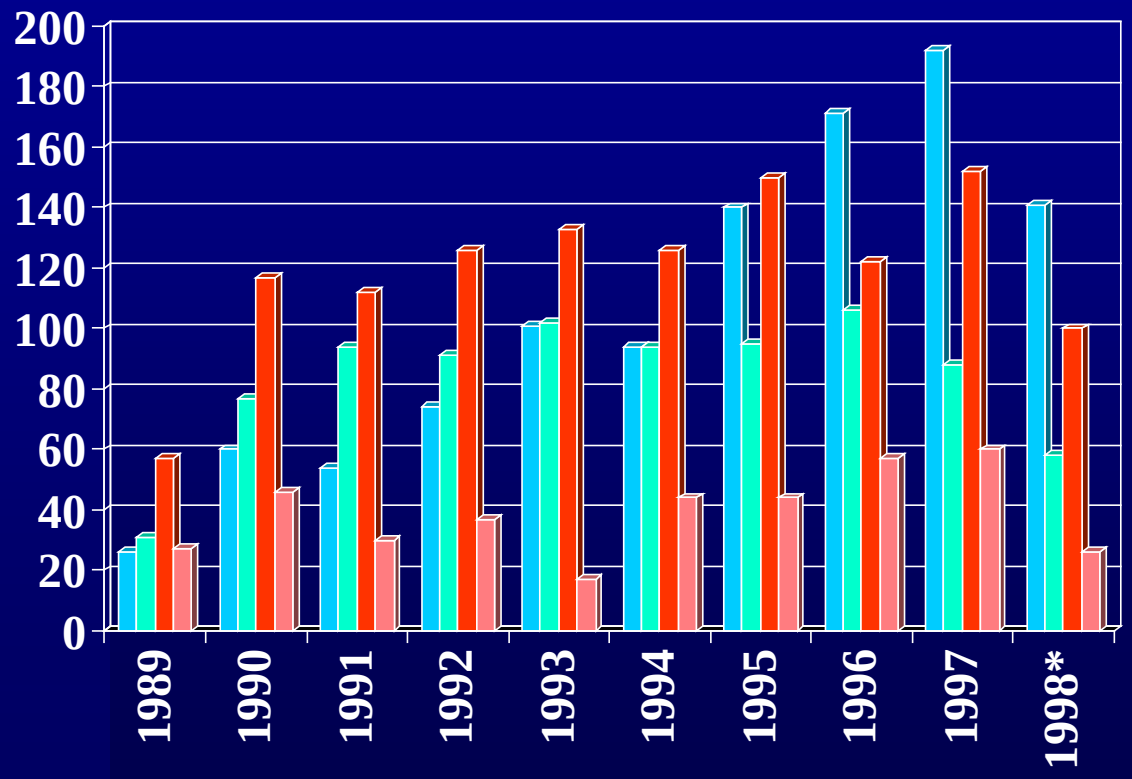
*** up to Sept 14th**

# FNAC - USM experience
# Type of cases

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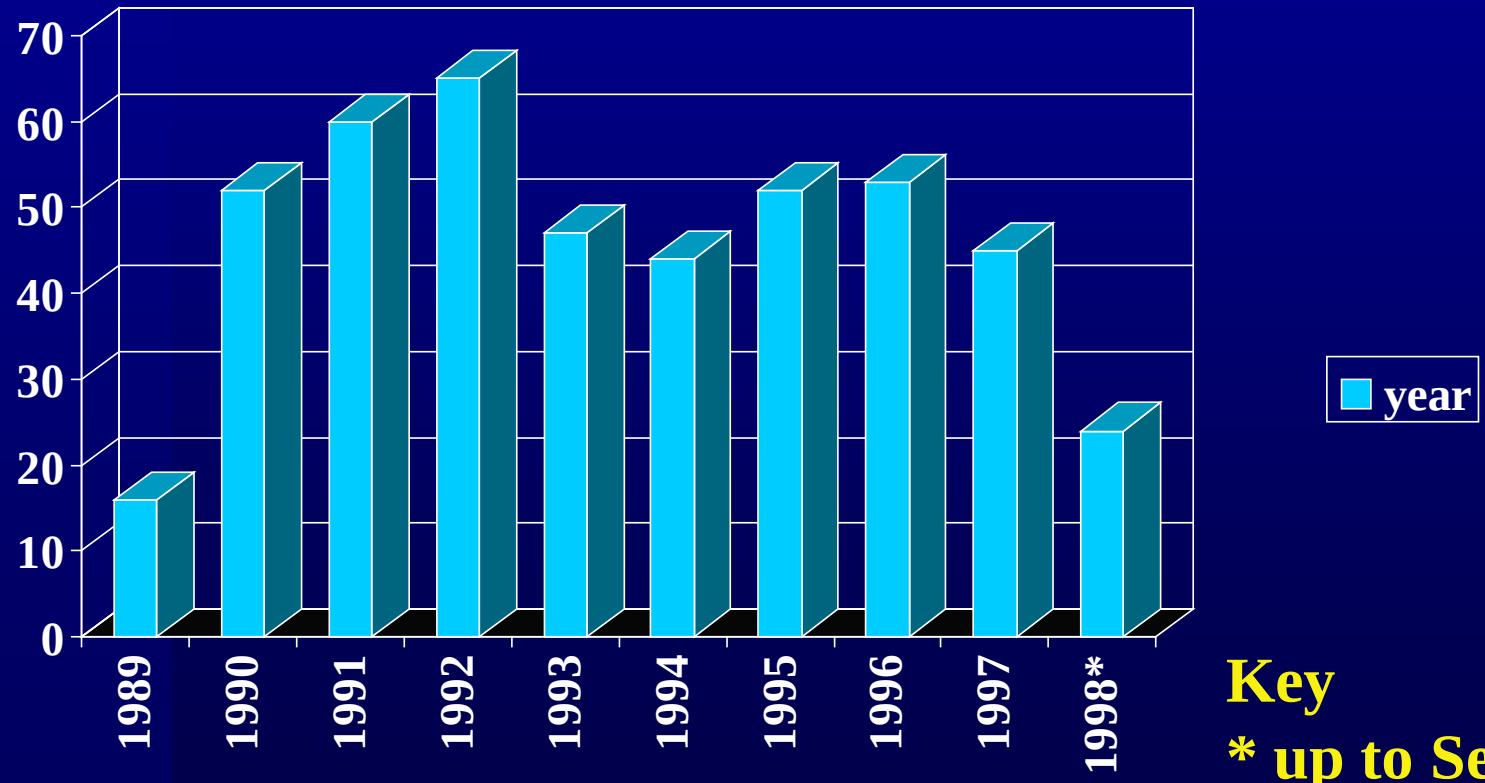
# FNAC - USM experience
# Cases under radioimaging

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*** up to Sept 14th**

# Acknowledgement


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