

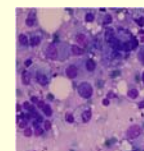
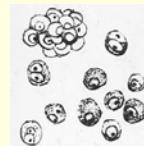
FINNÅLSASPIRATION MAMMA WORKSHOP 2007

- BAGGRUND
- FNAC TEKNIK
- DIAGNOSTISKE KATEGORIER
- DIAGNOSTISKE FALDGRUBER



Finnålsaspiration (FNAC) baggrund

- Johannes Muller 1839
 - Illustration af neoplastiske celler fra mammacarcinom. The University of Berlin
- James Paget 1853
 - FNAC som diagnostisk redskab Lectures on tumours. London
- Fred Stewart 1933
 - The diagnosis of tumors by aspiration. Am J Pathol
- Sixten Franzen og Joseph Zajicek 1968
 - Aspiration biopsy in diagnosis of palpable lesions of the breast. Critical review of 3479 consecutive cases Acta Radiologica



FNAC MAMMA

- Sundhedsstyrelsen redegørelser vedrørende mammografiscreening.
- DBCG Danish Breast Cancer Cooperative Group – landsdækkende retningslinjer. www.dbcg.dk
- European guidelines for quality assurance in breast cancer screening and diagnosis. Fourth Edition 2006 European Commission www.schultzboghandel.dk



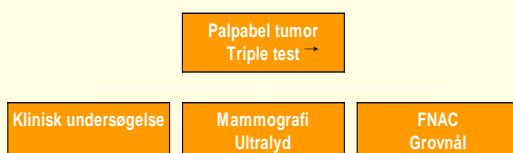
FNAC MAMMA

Anbefalede minimumsstandarder

- | | |
|---|-------|
| ■ Diagnostisk sensitivitet | > 60% |
| ■ Komplet sensitivitet | > 80% |
| ■ Specificitet | > 55% |
| ■ Positiv prædiktiv værdi(C5) | >98% |
| ■ Falsk negativ rate | <6% |
| ■ Falsk positiv rate | <1% |
| ■ Uegnet rate | <25% |
| ■ Uegnet rate i prøver taget fra carcinomer | <10% |
| ■ Suspekt rate | <20% |

European guidelines for quality assurance in breast cancer screening and diagnosis. Fourth Edition 2006 European Commission

Det integrerede diagnostiske system



FNAC MAMMA

- FNAC
 - Minimal invasiv procedure
 - Definitiv non-operativ diagnose
 - Palpable og Non-palpable læsioner
- Multidisciplinært Team
 - Radiolog
 - Kirurg
 - Patolog
 - Onkolog

Fordele FNAC

- Nem
- Hurtig
- Billig
- Sampling
 - i.e. celler fra forskellige områder i læsionen

Diagnostisk sikkerhed ved anvendelse af FNAC afhænger af:

- Et materiale der er tilstrækkeligt cellerigt og repræsentativt for læsionen
 - Som hovedregel minimum ca 5 velbevarede epiteliale cellegrupper, men i øvrigt afhængigt af den aktuelle problemstilling.
- Beherskelse af både FNAC aspirationsteknik og efterfølgende farveprocedure uden fremkomst af artefakter
- Korrekt fortolkning af det cytologiske materiale med en klart forståelig beskrivelse og diagnose til resten af det multidisciplinære team

Finnålsaspiration



Fine
Needle
Aspiration
Cytology

Teknisk procedure: 1



Trin 1: Fiksering af process



Trin 2: Aspiration



Trin 3 : Undertryk ophæves inden kanylen fjernes

Teknisk procedure: 2



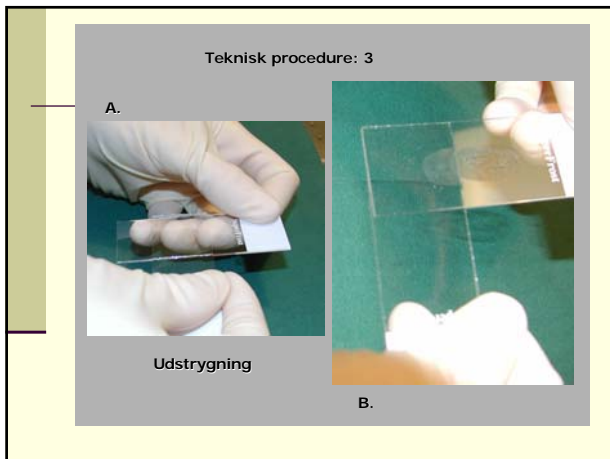
Trin 4: Kanylen tages af sprøjten



Trin 5: Stemplet trækkes tilbage



Trin 6: Aspiratet overføres til objektglas



FNAC EGNETHED

- Mindst 5 velbevarede grupper af epiteliale celler.
- Såfremt den kliniske problemstilling anfører lipom eller lymfeknude kræves selvsagt ikke tilstedeværelse af epiteliale celler.

FNAC MAMMA Hvad kigger man efter ?

- Cellularitet
- Baggrund
- Celletype/r
- Kerner
- Nøgenkerner
- Kohæsion

The BI-RADS (Breast Imaging Reporting and Data System) classification of the American College of Radiology (ACR)2003.

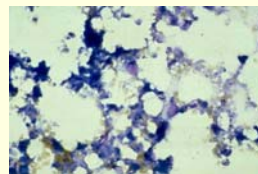
- FNAC
 - Diagnostiske kategorier
 - C1. Uegnet
 - C2. Benign
 - C3. Atypisk, formentlig benign
 - C4. Malignitetssuspekt
 - C5. Malign

Diagnostik FNAC C1 Uegnet

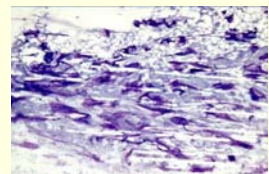
- e.g.
 - For stor blodtilblanding
 - Hypocellularitet
 - Teknisk problem
 - Aspiration
 - Udstrygning
 - Farveprocedure

Diagnostik FNAC C1 Uegnet

Husk altid at begrunde årsagen til din C1: uegnet



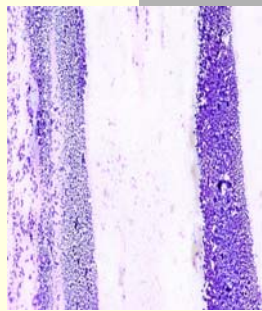
Hypocellulært



For hårdt udstroget materiale

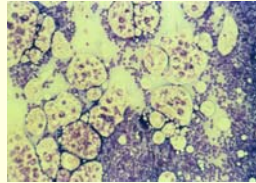
Diagnostik FNAC C1 Uegnet

- UL-gel

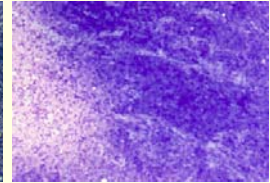


Diagnostik FNAC C1 Uegnet

Husk altid at begrunde årsagen til din C1: uegnet



Tørringsartefakt



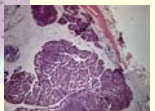
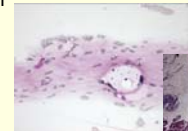
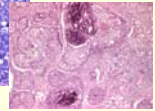
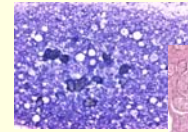
For tyk udstrygning

Diagnostik FNAC C1 Uegnet

- C1: Uegnet
- Pitfalls:
 - Necrose
 - Mikroforkalkninger
 - Slim
- Husk: Begrund årsagen for din diagnose når du anvender C1

Diagnostik FNAC C1 Uegnet

- Pitfalls:
 - Nekrose
 - Mikroforkalkninger
 - Slim

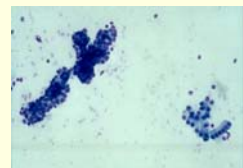


Diagnostik FNAC C2 Benign

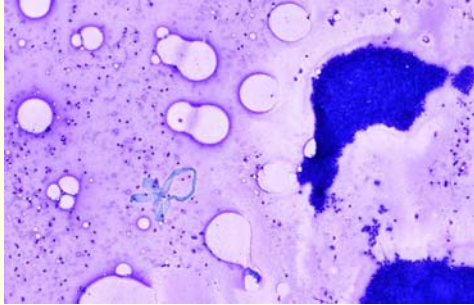
- Repræsentativ uden tegn på malignitet og/eller diagnostisk for en specifik benign proces
 - **Fibroadenom**
 - Lipom
 - **Cyste**
 - **Graviditet/Laktation**
 - **Fedtnekrose**
 - Adenose
 - Følger til tidligere kirurgisk indgreb (cikatricielle /eller reaktive forandringer)
 - Absces
 - Lymfeknude

Diagnostik FNAC C2 Benign

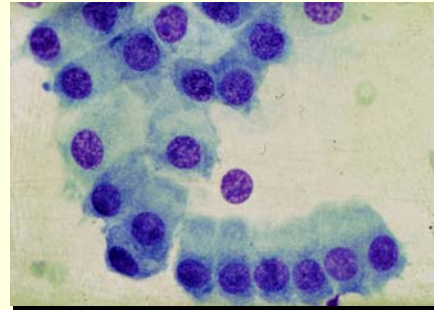
- Aspirat fra normalt mamma-kirtelvæv:
 - Ductale epitel celler
 - Bipolære nøgen kerner
 - Apokrine celler
 - Stroma



Nøgen kerner



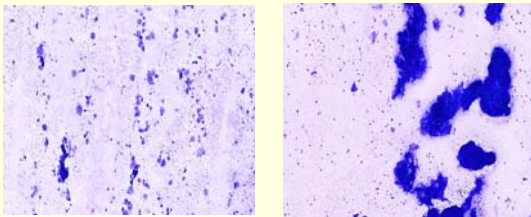
Diagnostik FNAC C2 Benign



Apokrine celler

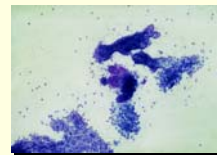
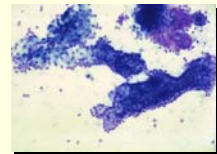
C2 Benign

- Cyste
- Makrofager
- Apokrint epitel

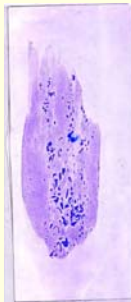


Diagnostik FNAC C2 Benign

- Fibroadenom
 - Forgrenede strøg af epitelliale celler
 - Bikagemønster el. monolag
 - Stroma
 - Bipolære nøgenkerner i baggrunden
 - Cellerigt materiale

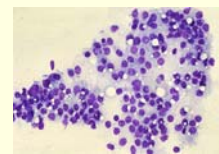
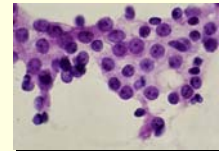


Fibroadenom oversigt



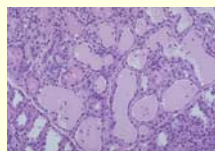
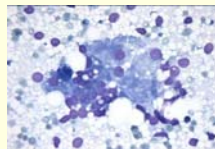
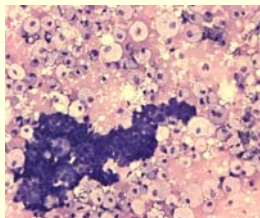
Diagnostik FNAC C2 Benign

- Graviditet/laktation:
 - Cellulært materiale
 - Moderat kernestørrelsesvariation
 - Makronucleoler
 - Vakuoliseret cytoplasma
 - Proteinøs baggrund



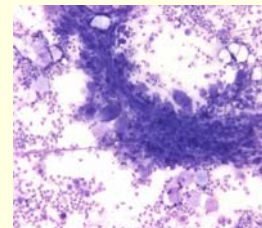
Diagnostik FNAC C2 Benign

- Graviditet/laktation



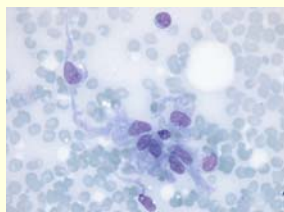
Diagnostik FNAC C2 benign

- Følger til tidligere kirurgi:
 - Granulocytter
 - Makrofager
 - Stroma



Diagnostik FNAC C2 benign

- Stråleforandring
 - Kernepleomorfi
 - Hyperkromasi
 - Nukleoler
 - "Tenformede" celler
 - Stroma
 - Makrofager
 - epitel

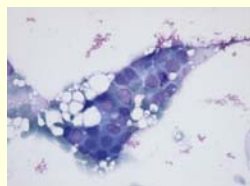
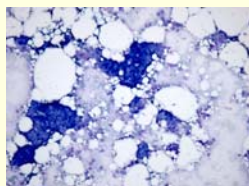


Diagnostik FNAC C2 Benign

- Pitfalls:
 - Tubulært Carcinom
 - Invasivt Lobulært Carcinom Grad I
 - Invasivt Ductalt Carcinom Grad I
 - Ductalt Carcinom in Situ Grad I
- Husk: check altid kliniske oplysninger og mammografibeskrivelse

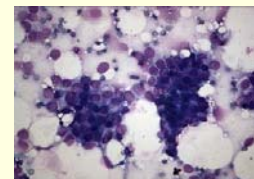
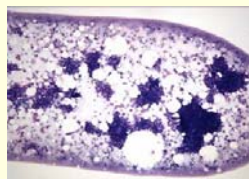
Diagnostik FNAC C2 Benign

- Pitfalls:
 - Tubulært Carcinom



Diagnostik FNAC C2 Benign

- Pitfalls:
 - Invasivt Ductalt Carcinom Grad I



Diagnostik FNAC C3 Atypi

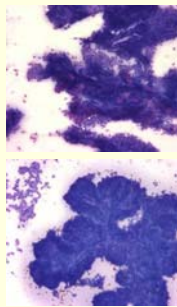
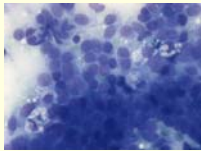
- Atypi formentlig benign
- Følgende forandringer kan ses:
 - Øget kerneatypi
 - Nedsat intercellulær kohæsion
 - Kerner tætlejrede i tredimensionale grupper og strøg
 - Proliferative forandringer
 - Reaktive forandringer

Diagnostik FNAC C3 Atypi

- Pitfalls:
 - Benigne læsioner samt reaktive forandringer og artefakter.
 - e.x.
 - Papillom
 - Fibroadenom
 - Fedtnekrose
 - Artefakt
 - Graviditet/Laktation
 - Cyste
 - Abscess
 - Adenose
 - Radialt ar
 - Carcinomer med lav malignitetsgrad e.x. Adenoid Cystic Carcinoma
 - Husk: Excisions biopsi vil ofte være en konsekvens af denne diagnose.

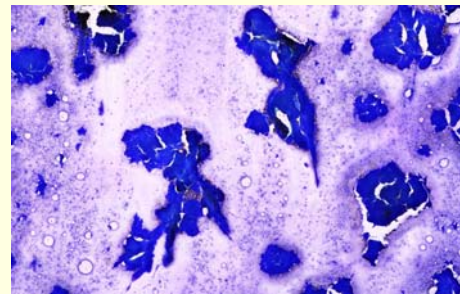
Diagnostik FNAC C3 Atypi

- Papillom
 - høj cellularitet
 - "Staghorn" mønster
 - bindevævsseptæ
 - Nøgne kerner
 - excisionsbiopsi



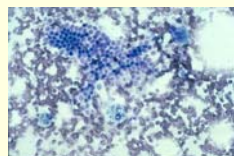
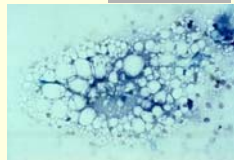
Diagnostik FNAC C3 Atypi

- Papillom



Diagnostik FNAC C3 Atypi

- Pitfalls:
 - Fedt nekrose
 - Fedtceller
 - Skummakrofager
 - Kerneatypi forårsaget af artefakt
 - Blodkontaminering



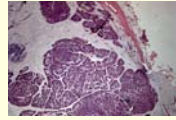
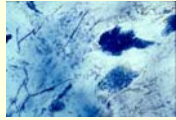
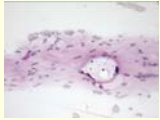
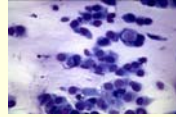
Diagnostik FNAC C4 malignitetssuspekt

- Præparatet ofte karakteriseret af
 - Hypocellularitet
 - Dårligt bevarede celler
 - Nekrose
 - Større grad af cellulær "atypi" end i C3
 - Forekomst af maligne celler i et ellers benignt udseende materiale

Diagnostik FNAC C4 malignitetssuspekt

Husk:

- Extracellulært lokaliseret slim bør diagnostiseres som C4
- Endelig kirurgi må ikke baseres på C4

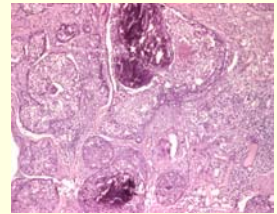
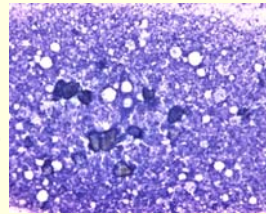


Mucinøst adenocarcinom

Diagnostik FNAC C4 malignitetssuspekt

Pitfalls:

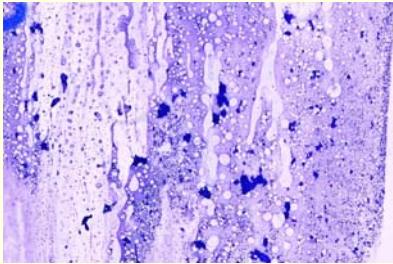
- Nekrose



Diagnostik FNAC C4 malignitetssuspekt

Pitfalls

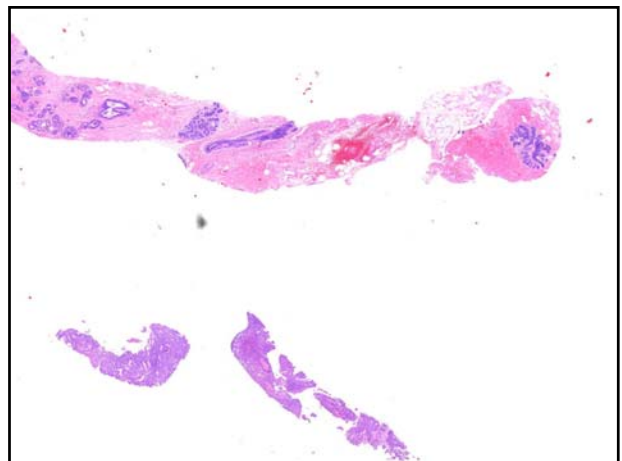
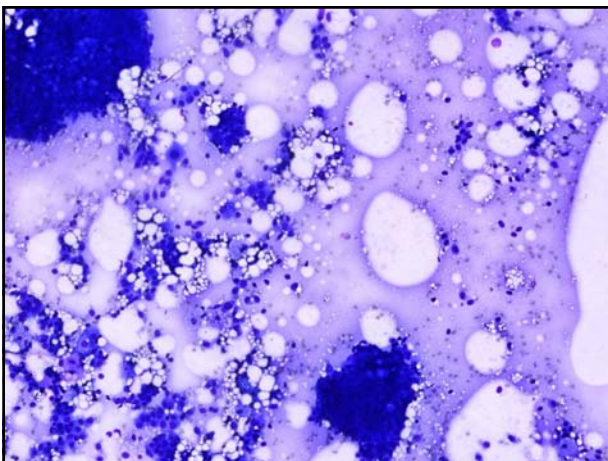
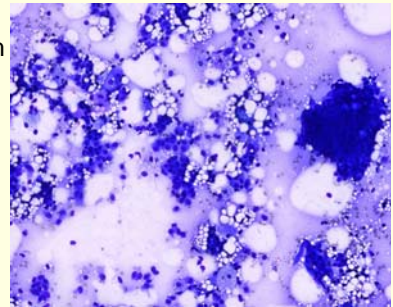
- Papillom



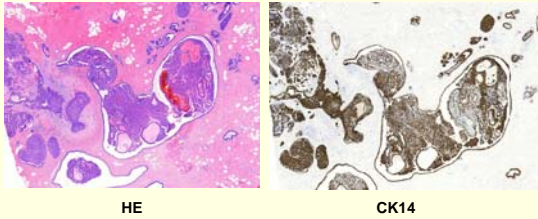
Diagnostik FNAC C4 malignitetssuspekt

Pitfalls

- Papillom



Diagnostik FNAC C4 malignitetssuspekt



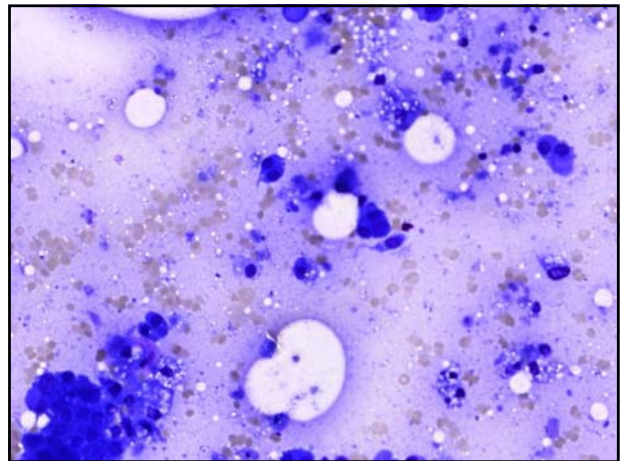
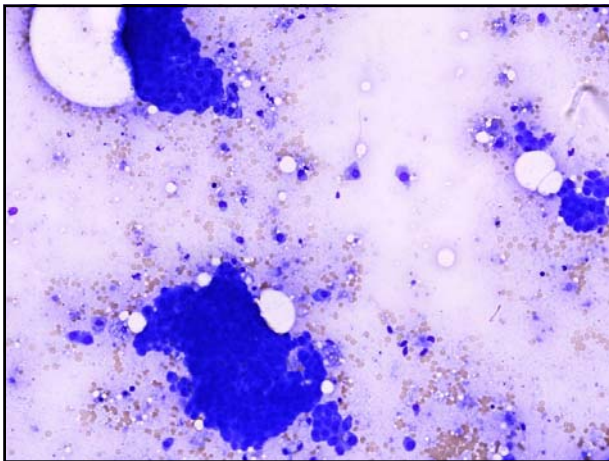
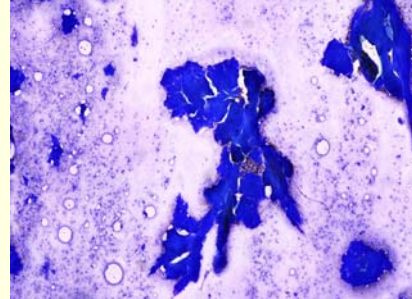
HE

CK14

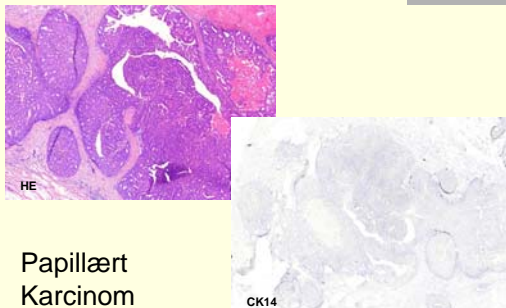
- Pitfalls
 - Papillom
 - Histologi

Diagnostik FNAC C4 malignitetssuspekt

- Papillært Karcinom OBS!



Diagnostik FNAC C4 malignitetssuspekt



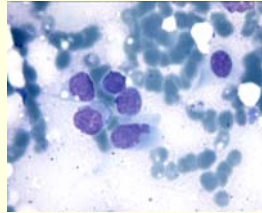
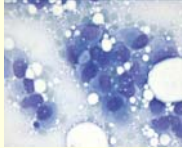
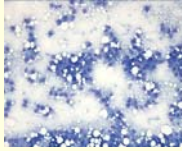
Papillært
Karcinom

CK14

Diagnostik FNAC C5 malign

- Definition af C5
 - e.g. Materialet skal være repræsentativt og diagnosen stilles på baggrund af en kombination af karaktertræk og ikke på baggrund af et enkelt kriterium.
 - Cellulært materiale
 - Nedsat intercellulær kohæsion
 - Tredimensionel lejrning af cellegrupper
 - Kerneoverlejrning
 - Kernekaraktistika
 - Irregulær kernemembran
 - kernepleomorfi
 - Øget kerne/cytoplasma ratio
 - Hyperkromatiske kerner med nukleole
 - I baggrunden kan ses nekrose

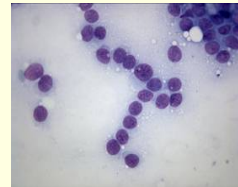
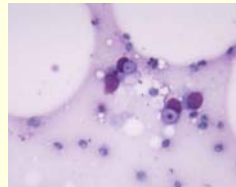
Diagnostik FNAC C5 Malign



Invasivt duktalt karcinom

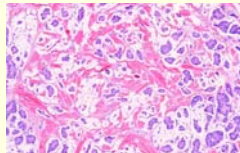
Diagnostik FNAC C5 Malign

- Invasivt lobulært karcinom
 - Kan være cellefattige
 - Stor andel af nonkohæsive celler som udviser beskednen grad af atypi og pleomorfi
 - Excentrisk placeret kerne med fokalt irregulær kernemembran med små "exrescencer"
 - Celler med intracytoplasmatiske vakuoler
 - Der kan ses celler arrangeret i "single files"



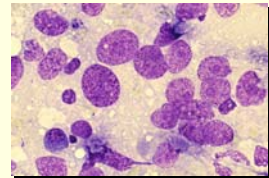
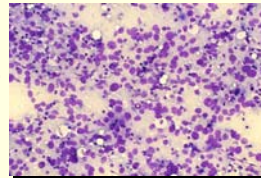
Diagnostik FNAC C5 Malign

- Mucinøst karcinom
 - Lyslilla mucin i baggrunden
 - Ofte ganske ensartede cellegrupper med pæn kohæsion
 - led efter enkeltliggende celler
 - Evt. tynde kar lokaliseret i slimen

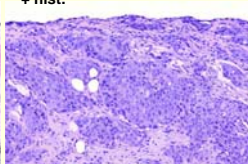
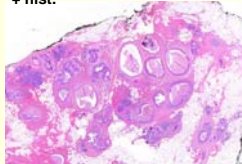
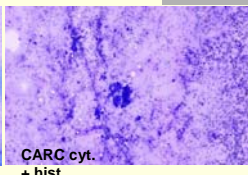
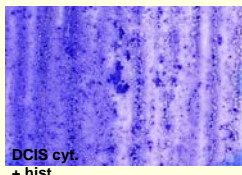


Diagnostik FNAC C5 Malign

- Medullært Carcinom
 - Baggrund med lymfocytter og plasmaceller
 - Store pleomorfe tumorceller i flager eller enkeltvis
 - Tumorcellekerner uden omgivende cytoplasma



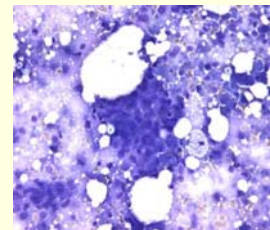
Diagnostik FNAC C5 Malign



Diagnostik FNAC C5 Malign

■ Pitfalls (C4 & C5):

- Fibroadenom
- Papillom
- Radialt ar
- Lactation
- Forandringer efter kirurgi
- Forandringer efter strålebehandling
- Microglandular adenosis
- Apocrine celler
- Artefakt
- Fedt nekrose
- Stråleforandring

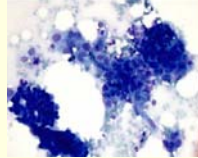
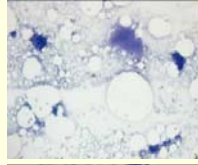


Diagnostik FNAC C5 Malign

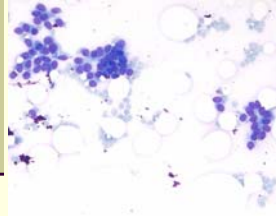
■ Pitfalls

■ Radialt ar

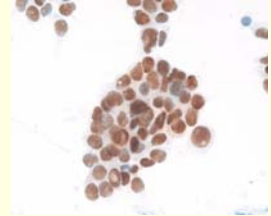
- Mammografi
 - Stelat process
- Cytologi
 - Kohæsive små cellegrupper
 - Der ses nøgne bipolarere kerner
 - Monotomt udseende celler
 - Cellefattigt stroma
- Altid kirurgi



Diagnostik FNAC Immuncytokemi på udstrygning eller koagel

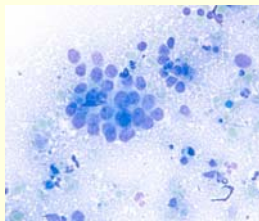


Invasivt duktalt carcinom

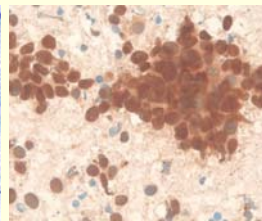


Østrogen receptorstatus (ER)

Diagnostik FNAC Immuncytokemi



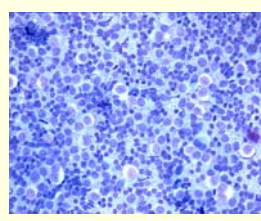
Adenocarcinommetastase til mamma fra primært adenocarcinom i lungen



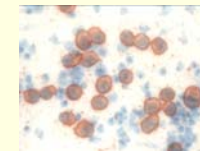
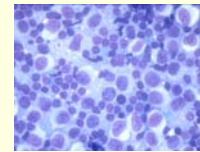
Thyroid Transcription factor (TTF1)

Diagnostik FNAC Immuncytokemi

Lymfeknude med metastase fra lobulært carcinom



FNA udstrygning MGG



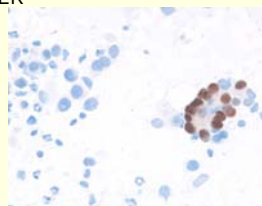
CAM5.2

Diagnostik FNAC Immuncytokemi

■ Pitfall

■ ER

- Husk at der i et udstygningspræparat fra et carcinom kan være en komponent af benignt epitel som reagerer positivt ved farvning for ER



FNAC Diagnostik

■ Husk:

- C1 Uegnet
 - Begrund din diagnose
- C2 Benign
 - Check klinik og mammografibeskrivelse
- C3 Atypiske celler, formentlig benign
 - Næsten altid excisionsbiopsi
- C4 Malignitetssuspekt
 - Altid excisionsbiopsi/lumpektomi
- C5 Malign
 - Check klinik og mammografibeskrivelse

■ Husk:

- Endelig kirurgi bør ikke baseres alene på FNAC

FNAC Pitfalls

- C1: Hypocellulære processer
 - Nekrose
 - Mikroforkalkninger
 - Slim
- C2-3: Højt differentierede maligne tumorer
- C4-5: Benigne neoplasier og proliferative forandringer
 - Reaktive forandringer
 - Inflammation
 - Forandringer som følge til tidligere kirurgi eller strålebehandling
 - Laktation
 - Benigne neoplasier
 - Ex
 - Fibroadenom
 - papillom

Diagnostiske Kriterier FNAC

European guidelines for quality assurance in breast cancer screening and diagnosis.
Fourth Edition 2006 European Commission

Criterion	Benign	Malignant
Cellularity	Usually poor or moderate	Usually high
Cell to cell cohesion	Good with large defined branching monolayers of cells	Poor with cell separation resulting in dissociated cells with cytoplasm or small clusters of intact cells
Cell arrangement	Usually in flat sheets (monolayers) with even distances between nuclei	Irregular with overlapping nuclei and three-dimensional arrangement
Cell types	Mixtures of epithelial, myo-epithelial and other cells with fragments of stroma	Usually uniform cell population
Bipolar (elliptical) bare nuclei	Present, often in high numbers	Not conspicuous
Background	Generally clean except in inflammatory conditions, or in cystic lesions	Dirty, due to necrotic debris (apoptotic nuclei, calcifications); desmoplasia (red stippling with fibroblasts); lymphocytes and macrophages

Diagnostiske Kriterier FNAC

European guidelines for quality assurance in breast cancer screening and diagnosis.
Fourth Edition 2006 European Commission

Nuclear characteristics	Benign	Malignant
Size (in relation to RBC diameter)	Small	Variable, often large, depending on tumour type
Pleomorphism	Rare	Common
Nuclear membranes (PAP stain)	Smooth	Irregular with indentations
Nucleoli (PAP stain)	Indistinct or small and single	Variable but may be prominent, large and multiple
Chromatin (PAP stain)	Smooth or fine	Clumped and may be irregular
Additional features	Apocrine metaplasia foamy macrophages	Mucin, intracytoplasmic lumina; psammomatous intraepithelial calcifications

