The FRCPath Exam

How to pass the short surgicals on the first go

By someone who didn't

Plus some tips on frozen sections!

Dr Paul Bennett

Overview

- Reminder of the exam format
- How to format your answer for the short surgicals
- Discussion of cases
- Brief discussion of frozen sections
- Mandatory viewing of holiday photos throughout talk

Exam Overview

- **Short Surgicals**
  - 20 cases
  - Given in pairs, 20 minutes per pair
  - When they’re gone, they’re gone
  - Can be anything
- **Long Cases**
  - 4 cases, 20 minutes per case
  - Special stains / immuno / FISH / EM

Exam Overview

- **Frozens**
  - 6 cases, 20 minutes per three cases
  - Scribble notes in the answer book
  - Viva at the end
- **OSPEs**
  - Two stations, one manned
  - A) Management issue
  - B) Data set and short answers

Exam Overview

- **Non-gynae cytology**
  - 8 cases, 20 minutes per pair
  - Often benign vs. malignant cases

- **Macros**
  - 4 cases, each with a photograph
  - Draw blocks on photograph
  - Answer short questions in Viva

Exam Overview

- Archaic marking system
  - Scored out of 5
    - 1 or 1.5 = fail
    - 2 = bare fail
    - 2.5 = pass
    - 3 = good answer
    - 3.5 = excellent answer
    - 4+ = ? Possible

Overall pass mark 50%

Why focus on the short surgicals?

- Obviously, each component of the exam requires preparation
- However, surgicals often cause problems
  - Largest single component of exam
  - Large variety of cases
  - Lots of writing

- A well-practised approach works

Justin breathed a sigh of relief after Sarah left. There was no way he was going to let her see where he lived. She probably would've felt like she was dropping off trash at the dump. He pictured her look of disgust at the sight of the squalor he called home.

He needed to get his car in working order again. Yeah, and the world needs an alternative energy source, he thought sarcastically. Doesn't mean it's going to happen. Was it too soon to ask one of the guys if he could borrow their ride? Probably, but he was in a ~~desperate situation~~ bind here. He wanted to — no, needed — to see Sarah again and he doubted she'd want to keep coming here.

But there was time to worry about that later. He sat back and reflected on the evening. [Spending with her left him more enchanted with her than ever.] He thought back to the few hours food, game and salad. He had to admit that he was pretty smitten with Sarah. He couldn't wait to see her in school tomorrow.

Justin let his mind drift in languorous daydream. He was so engrossed in ~~his thoughts~~ visualizing Sarah's smile that he didn't notice the big, hulking guy watching him from out back behind the counter. The guy had been watching him all evening — him and Sarah together — and now his shift had ended so he removed his cap and apron that had a nametag with "Matt" written on it. Matt thought briefly about confronting Justin right then but then thought better of it. He would just tell Braden tomorrow and see how he wanted to handle it.

CHAPTER 6 : THE HORROR UNLEASHED

Braden maneuvered the jeep slowly down the rocky path. ~~They were surrounded by dense forest on either~~ Tall trees enclosed them on both sides, allowing only a sliver of the clear night sky to show. The only sound was the gently flowing river, which was nearby.

The jeep to a stop and Braden squinted his eyes.

"There it is," he intoned (affirmed?)

They all looked over and saw the solid black outline of a small

Approaching the Questions

- Use a tried and tested format that you are familiar with
- Answer every question the same way
- I emailed my preferred format to you – a 6 point approach (credit to Dr D Scott)
- This format will allow you to maximise marks for each question

Approaching the Questions

1. Description
2. Interpretation
3. Differential diagnosis
4. Extra investigations
5. Clinico-pathological correlation
6. Bottom line diagnosis

Approach to a Case

- **Description**
  - Keep it brief
  - Include description of type of lesion (eg neoplasm, inflammatory process)
  - Brief description of architecture and morphology if it's a lesion
  - Mention dataset items if a tumour (margin involvement, necrosis, vascular invasion, etc)
  - Don't forget to grade any neoplasms
  - May be appropriate to comment on the background tissue briefly

Approach to a Case

- **Interpretation**
  - Should immediately follow description and summarise your thoughts on the H+E slide
  - State diagnosis if you're sure
    - *"This is a malignant melanoma"*
  - If you're not sure, go as far as you can
    - *"This is a malignant epithelioid neoplasm"*
  - If you're really struggling
    - "*This is an epithelioid neoplasm*"

Approach to a Case

- **Differential Diagnosis**
  - One or two questions may require a differential
  - Will be unnecessary in most questions
  - For example, a malignant epithelioid neoplasm:
    - Carcinoma
    - Melanoma
    - Large cell lymphoma
    - Mesothelioma

Approach to a Case

- **Extra investigations (if appropriate)**
  - Start from the bottom
    - Levels (usually unnecessary but demonstrates safety if uncertain)
    - Special stains
    - Immunocytochemistry
      - Useful to incorporate immunostains into differential diagnosis
    - IMF
    - Cytogenetics
    - EM

Approach to a Case

- If the diagnosis is already established on morphology, mentioning extra investigations still adds extra value to your answer, eg:
  - Signet ring carcinoma: PAS +ve inclusions
  - Glomus tumour: SMA +ve
  - Pemphigus vulgaris: Reticular IgG/C3 on IMF
  - Well differentiated liposarcoma: MDM-2/CDK4 amplification on cytogenetics
  - Langerhan's cell histiocytosis: Birbeck granules on EM

Approach to a Case

- **Clinicopathological correlation**
  - Chance to earn extra credit
  - All malignant cases to relevant MDT
  - Classical histories
    - COCP use in liver adenoma
    - Epithelioid sarcoma – peripheral sites, young patients
  - Mention any classical symptoms
    - Painful ANGEL skin lesions
  - Typical imaging features
    - DCIS: Calcification on plain X-Ray

Approach to a Case

- **Clinico-pathological correlation (continued)**
  - Treatment
    - Melanomas – wider excisions +/- sentinel nodes
    - Adenocarcinoma of lung – EGFR inhibitors
    - GISTs – Tyrosine kinase inhibitors
  - Prognosis
    - Good – Nodular lymphocyte predominant Hodgkin's
    - Poor – Anaplastic large T cell lymphoma
  - Stage
    - If you can remember! Mention it regardless

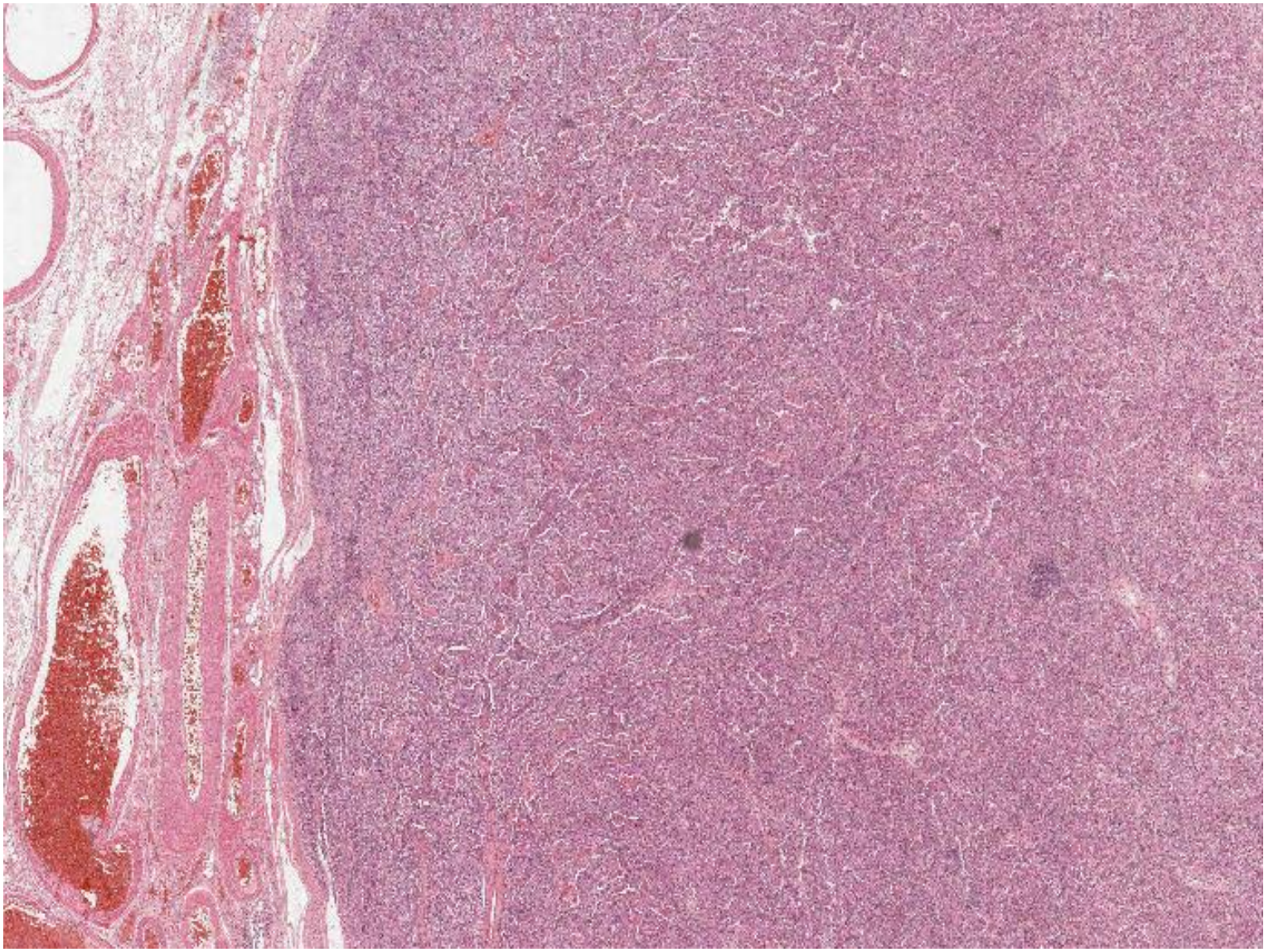
Approach to a Case

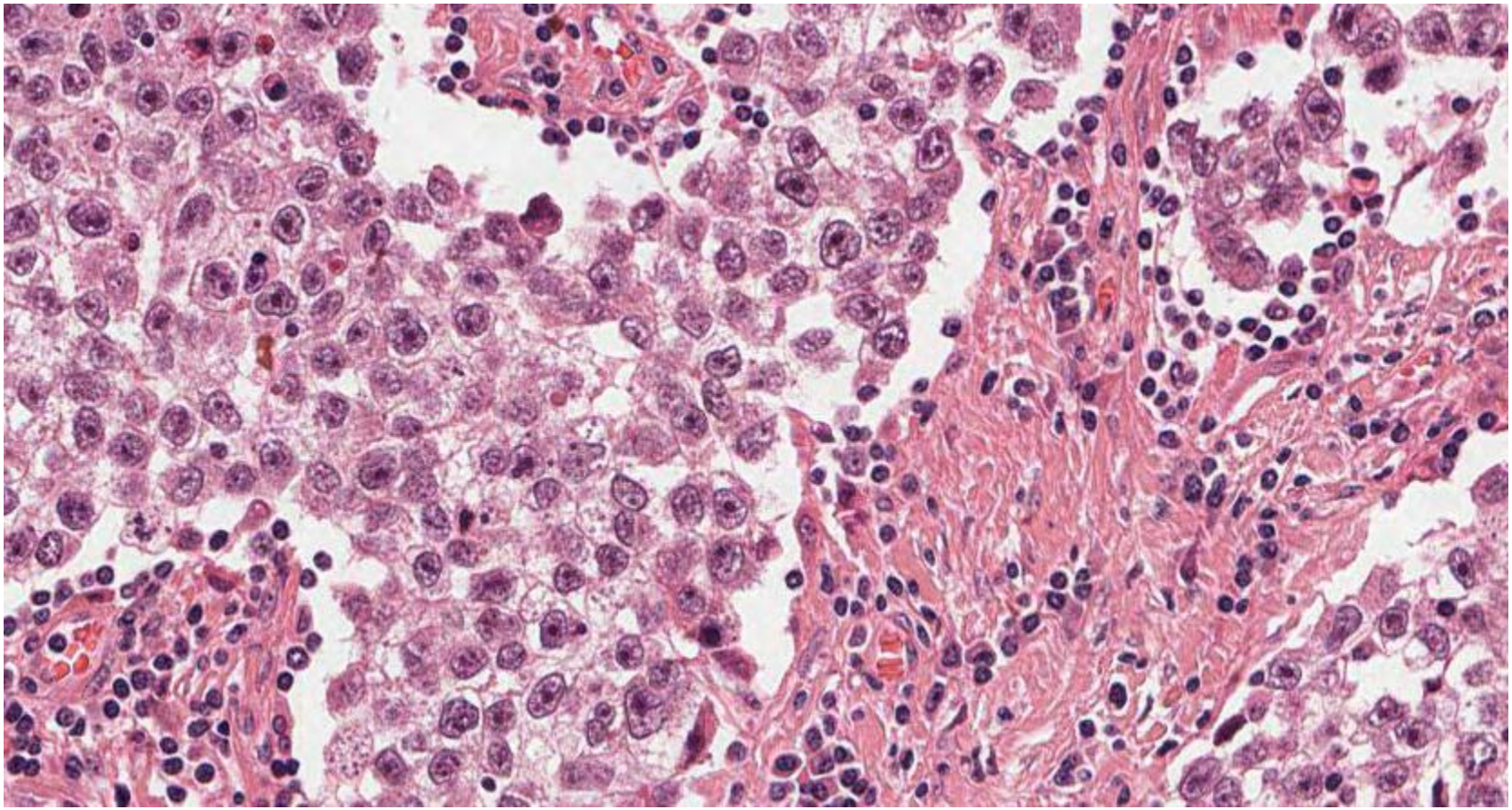
- **Bottom line diagnosis**
  - One line only

    This may be the first bit of your answer the examiner looks at. If it's right, you're off to a good start and the examiner can look for extra marks in the rest of your answer

Case 1

29M, testicular mass





Case 1

- **Description**
  - *Nested tumour separated by broad, lymphocyte-rich fibrous bands. The tumour cells show large nuclei, prominent nucleoli and delicate cytoplasm.*
  - *There is focal rete testis involvement*
  - *There is no evidence of vascular invasion or intratubular germ cell neoplasia*

Case 1

- **Interpretation**
  - *This is a classical seminoma*
  - *This is a malignant germ cell tumour*
  - *This is a malignant epithelioid neoplasm*

The further down the list, the less likely you are to pick up any marks

Case 1

- **Differential**
  - Shouldn't really need one – H+E spot diagnosis
  - Some other germ cell tumours (spermatocytic seminoma) lymphoma and melanoma are perhaps reasonable to suggest if you don't know
  - Either way…..

To the immuno!

Case 1

- **Extra investigations**
  - Not necessary if you've got the diagnosis on H+E
  - BUT, you can still mention classic staining pattern for possible extra points:
    - Classical seminoma: C-Kit, PLAP, Oct 3/4 positive
  - If working on differentials:
    - Spermatocytic Seminoma: C-kit & OCT 3/4 +ve; PLAP -ve
    - Lymphoma: CD45 +ve; germ cell markers -ve
    - Melanoma: Melan-A & S100 +ve; germ cell markers –ve

Case 1

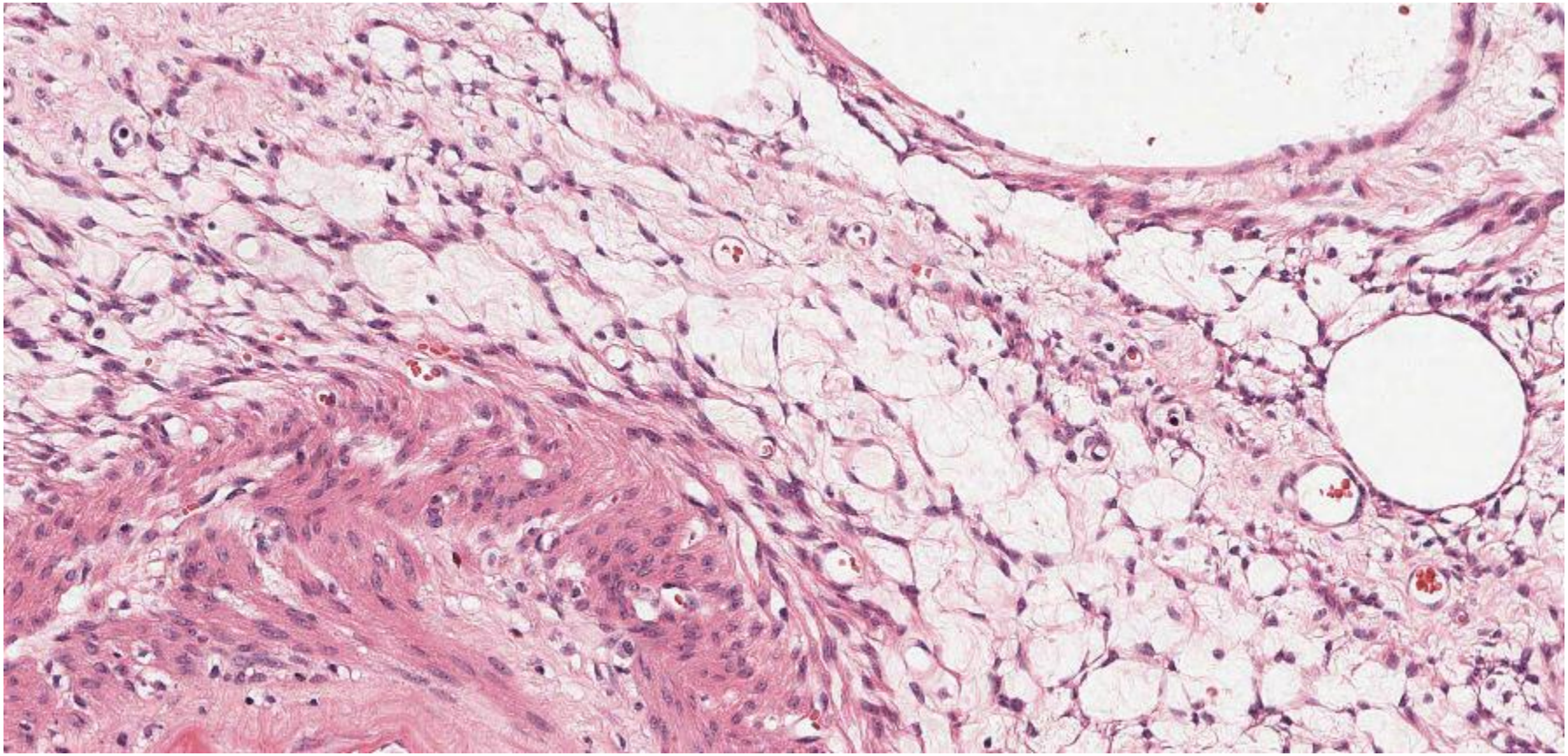
- **Clinico-pathological correlation**
  - Needs staging and discussion at MDT
  - Commoner in young men
  - Associated with history of undescended testes
  - Treatment – orchidectomy
  - Chemo if recurrent or advanced disease
  - Good prognosis in many cases
  - pT1 on this slide

Case 1

- **Testicular mass - Classical seminoma**

Case 2

67F, retroperitoneal mass



Case 2

- **Description**
  - *Diffuse tumour composed of admixture of fat, blood vessels and smooth muscle. The smooth muscle component emanates from the vessel walls*
  - *No obvious renal tissue in sections*
  - *No evidence of atypia, necrosis or increased mitotic activity*

Case 2

- **Interpretation**
  - *This is an angiomyolipoma (PEComa)*
  - *This is a mesenchymal tumour of uncertain malignant potential*
  - *This is a neoplasm*

Case 2

- **Differential**
  - *Very few… no real features of any other tumours expected at this site (RCC, adrenal tumours, well-diff liposarcomas)*
  - *Fat predominant or muscle predominant variants occur – in these cases a differential is reasonable*
  - *I wouldn't include a differential in this case – it's classical*

Case 2

- **Extra investigations**
  - *Positive immunoreactivity for HMB-45 + Melan-A*

Case 2

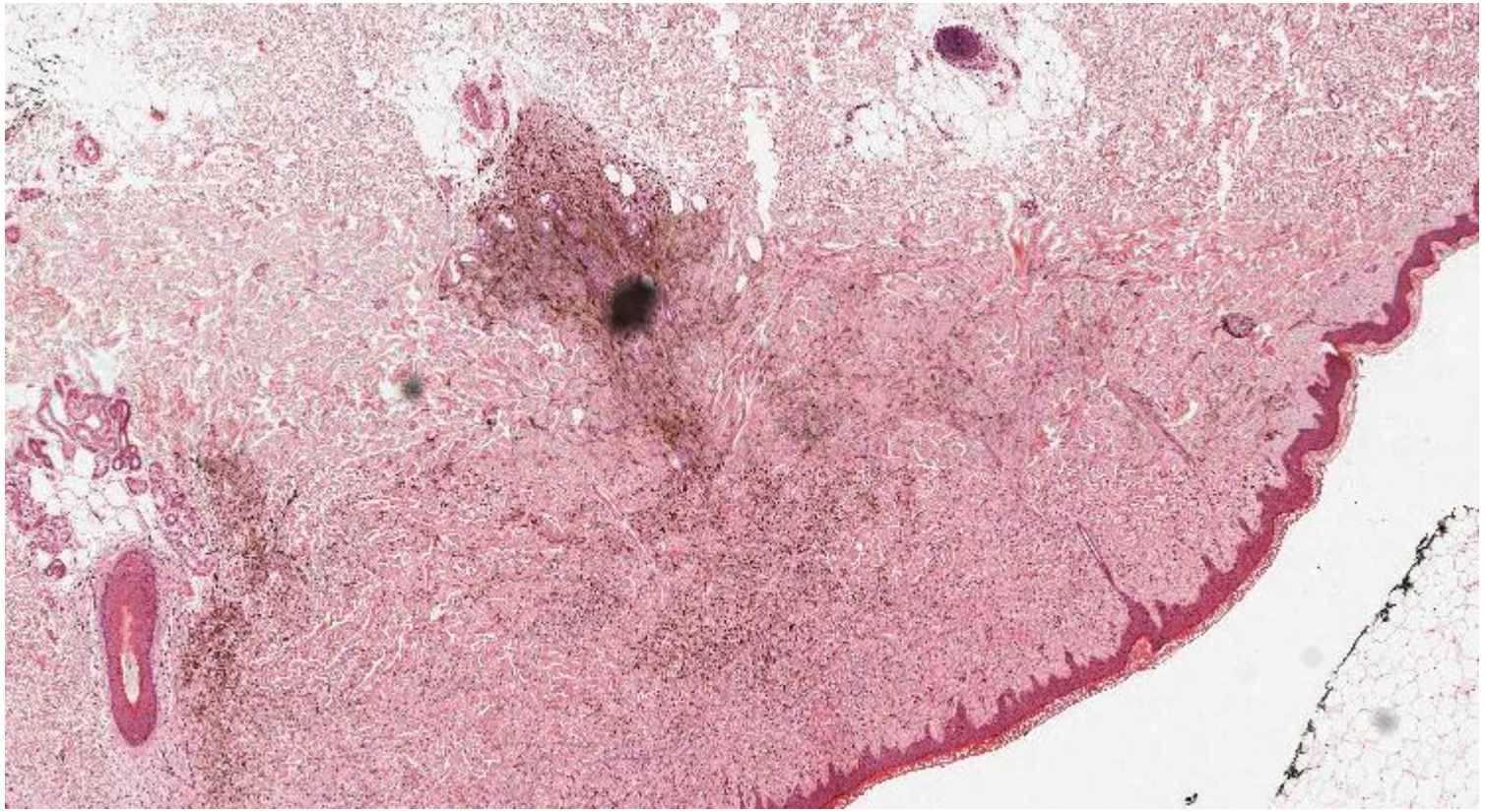
- **Clinico-pathological correlation**
  - *Discuss at sarcoma MDT*
  - *Variable malignant potential*
  - *Excision usually curative, though necrosis, increased mitoses and atypia increase risk of metastasis*
  - *Many (up to a third) associated with tuberous sclerosis*
  - *May co-exist with other PEComas*
    - *Clear cell tumours of the lung*
    - *Lymphangiomyomatosis*

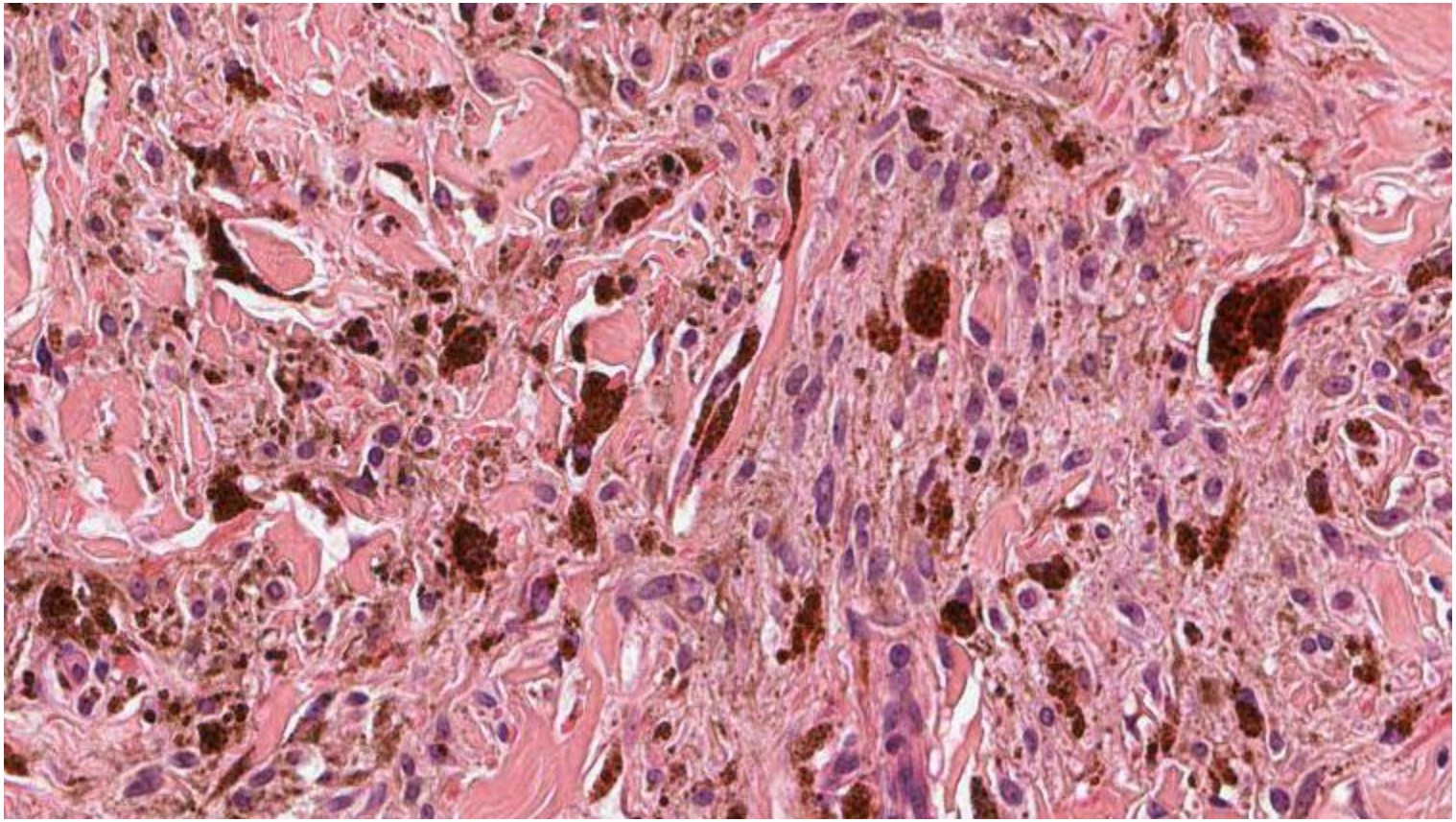
Case 2

- **Retroperitoneal mass - Angiomyolipoma**

Case 3

38M, lesion on arm





Case 3

- **Description**
  - *This is skin with a normal epidermis. The dermis contains a symmetrical proliferation of pigmented, spindled melanocytes. There is no evidence of atypia or mitotic activity. There is no evidence of a junctional component*
  - *This lesion appears completely excised*

Case 3

- **Interpretation**
  - *This is a blue naevus*
  - *This is a benign melanocytic proliferation*
  - *This is a melanocytic proliferation*

Case 3

- **Differential**
  - *Again, only necessary if you're not sure*
  - *Malignant melanoma (primary / metastatic)*
    - *If going down this line explain how you'd sort it out*
      - *Check history*
      - *Levels for junctional component / regression*
  - *Pigmented DFSP*
    - *Sort out on immuno if you're worried about this*

Case 3

- **Extra investigations**
  - *Pigment is Masson-Fontana positive, Perl's negative*
  - *Lesion is S100, HMB45, Melan-A positive*
  - *SMA and CD34 negative*

Case 3

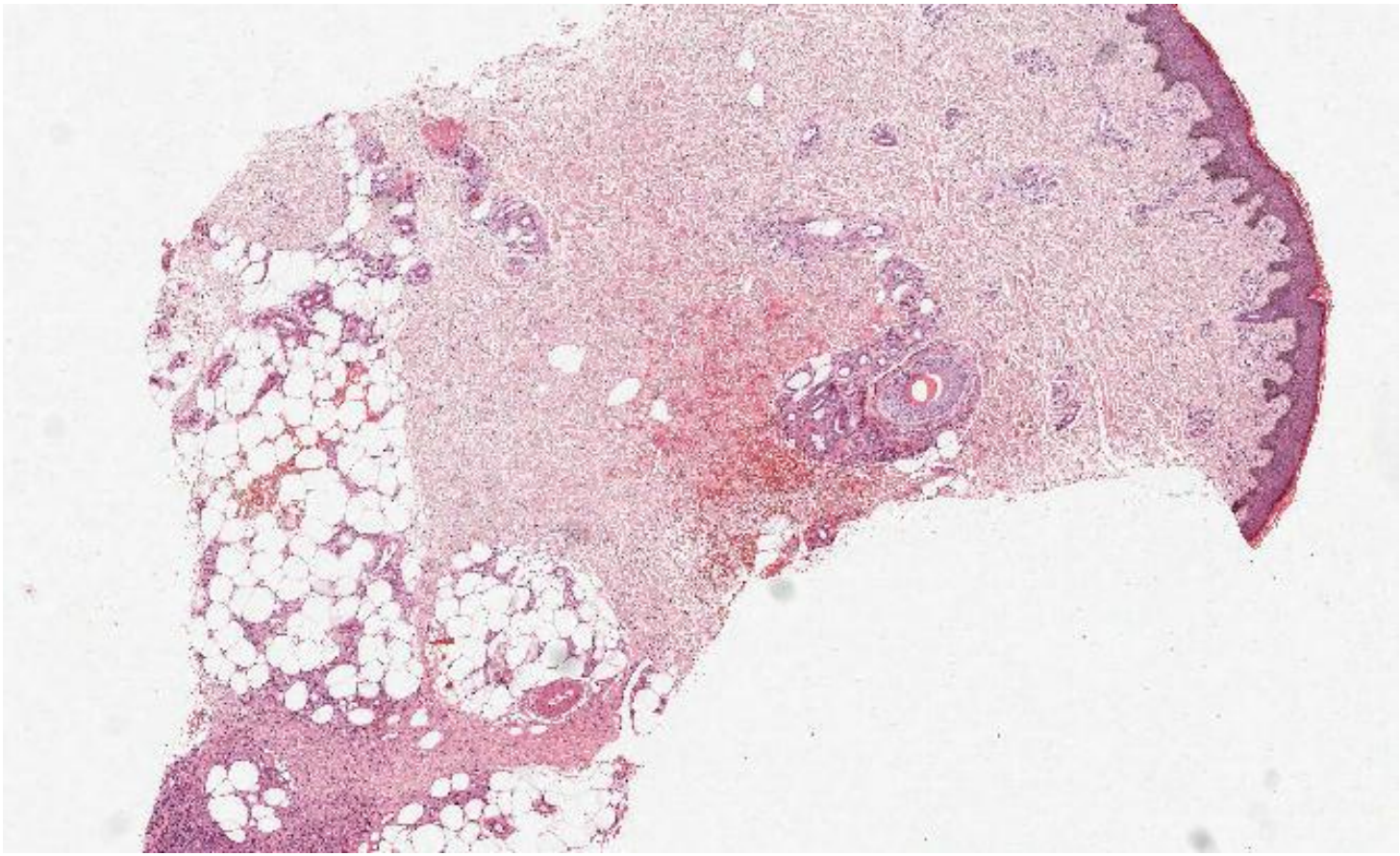
- **Clinico-pathological correlation**
  - Benign lesions
  - Small and blue macroscopically
  - Excision curative
  - BRAF / RAS mutations absent

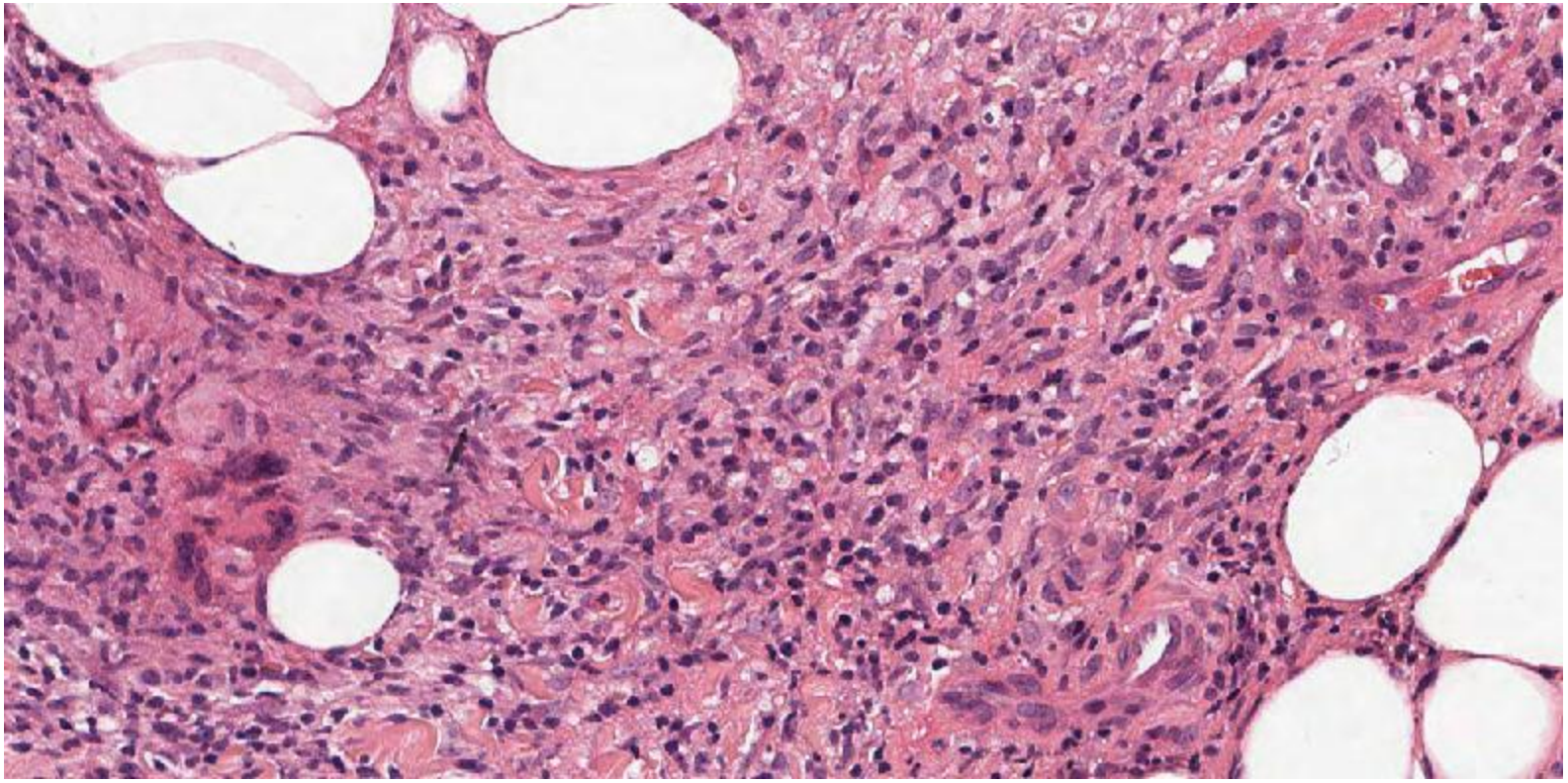
Case 3

- **Skin, arm - Blue naevus**

Case 4

52F, lesions on lower legs





Case 4

- **Description**
  - *This is a punch biopsy of skin and subcutaneous fat. The fat shows septal inflammation composed of histiocytes, lymphocytes and plasma cells. There is no evidence of vasculitis, necrosis or neoplasia. The overlying skin shows mild venous stasis-related features only*

Case 4

- **Interpretation**
  - *This is erythema nodosum*
  - *This is a septal panniculitis*
  - *This is panniculitis*
  - *This is an inflammatory process*

Case 4

- **Differential**
  - *Only if you're not sure*
  - *Lobular panniculitis*
    - *Secondary to pancreatitis*
    - *Could suggest serum amylase*

Case 4

- **Extra investigations**
  - *Fungal / ZN stains reasonable as granulomatous inflammation*

Case 4

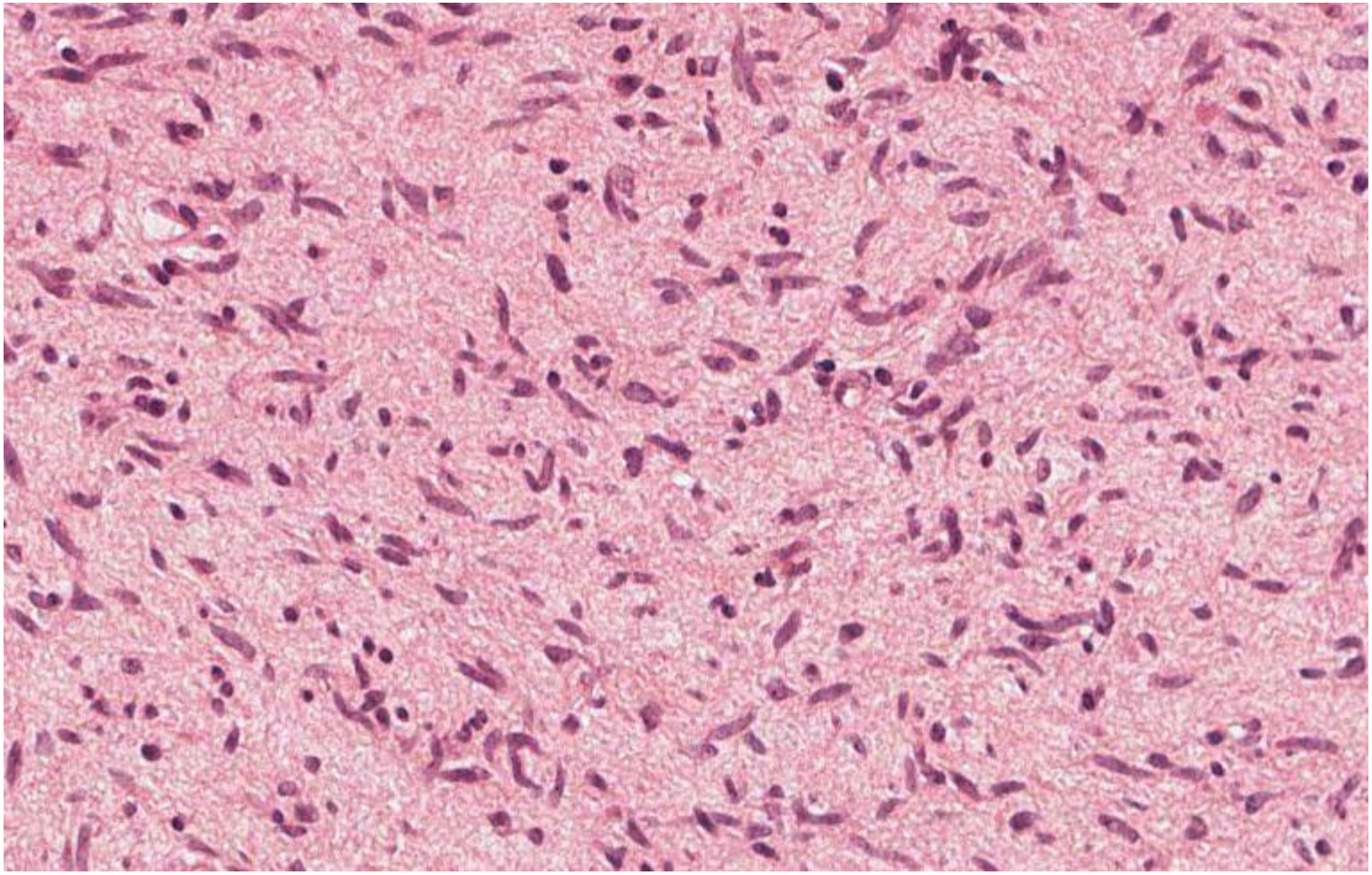
- **Clinico-pathological correlation**
  - *F>M*
  - *Lots of causes*
    - *Drugs (COCP) – check history*
    - *Infections (TB, Strep)*
    - *Malignancies (usu. haematological)*
    - *Crohn's*
    - *Sarcoid – recent chest X-Ray?*
  - *EN is often reactive and self-limiting*

Case 4

- **Skin, lower leg – Erythema Nodosum**

Case 5

M16, multiple skin lesions – excision of one from arm



Case 5

- **Description**
  - *This is skin with a normal epidermis. The dermis contains a well-circumscribed proliferation of spindle cells with bland buckled nuclei and admixed mast cells. There are no features of atypia, mitotic activity or necrosis*
  - *This lesion is incompletely excised at the deep margin*

Case 5

- **Interpretation**
  - *This is a neurofibroma*
  - *This is a benign neural lesion*
  - *This is a benign mesenchymal / spindle cell tumour*
  - *This is a benign neoplasm*

Case 5

- **Differential diagnosis**
  - *If not sure:*
    - *Dermatofibroma not an unreasonable suggestion, but unlikely to do you much good in a simple case like this*

Case 5

- **Extra investigations**
  - Not necessary in reality, but could state that neurofibromas are S100 positive (patchy)

Case 5

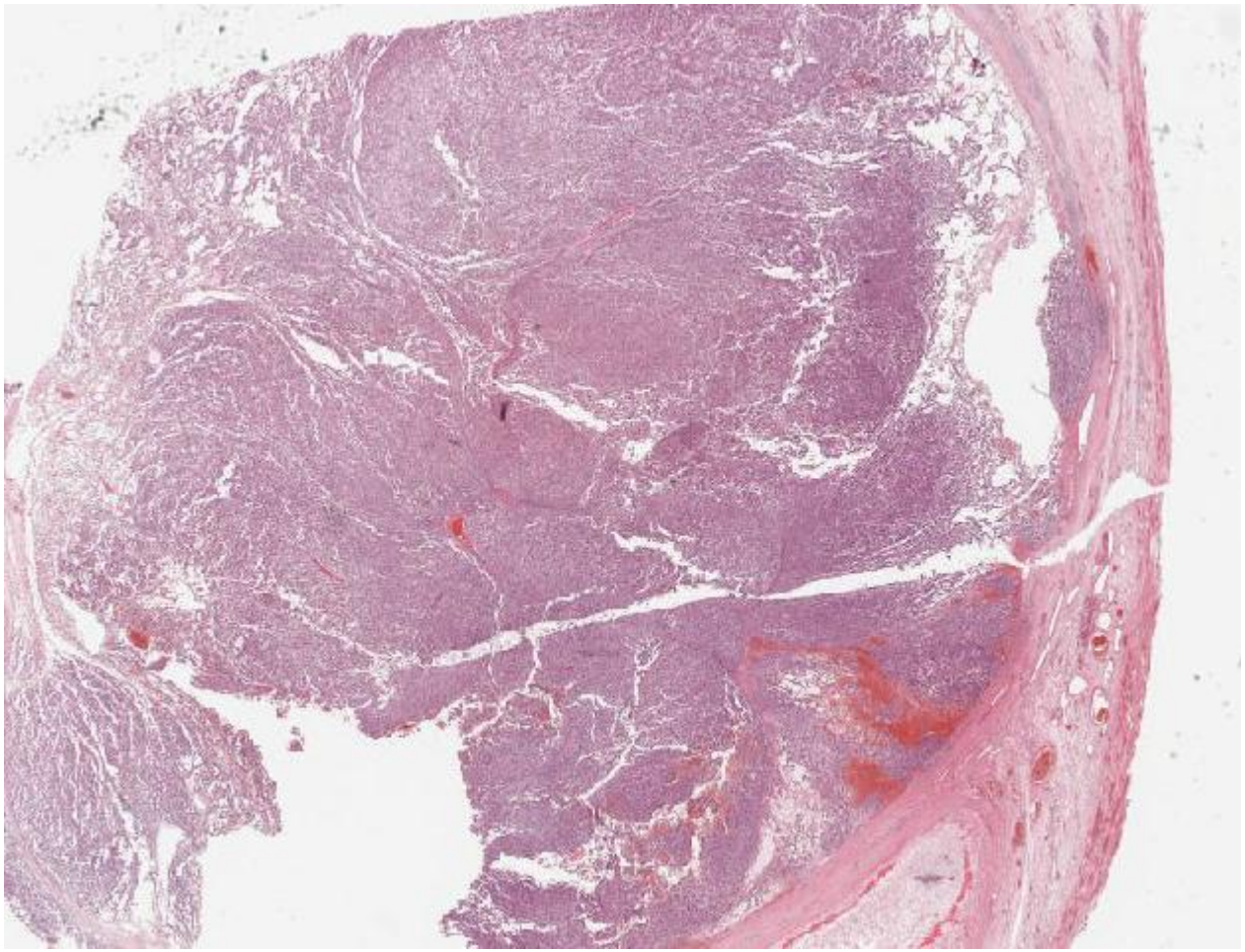
- **Clinico-pathological correlation**
  - History of multiple lesions!
  - NF-1 must be considered
    - Café au lait spots, Lisch nodules
    - Increased risk of MPNST
    - Be firm that this case is benign (no mitoses etc)
  - Otherwise excision is curative

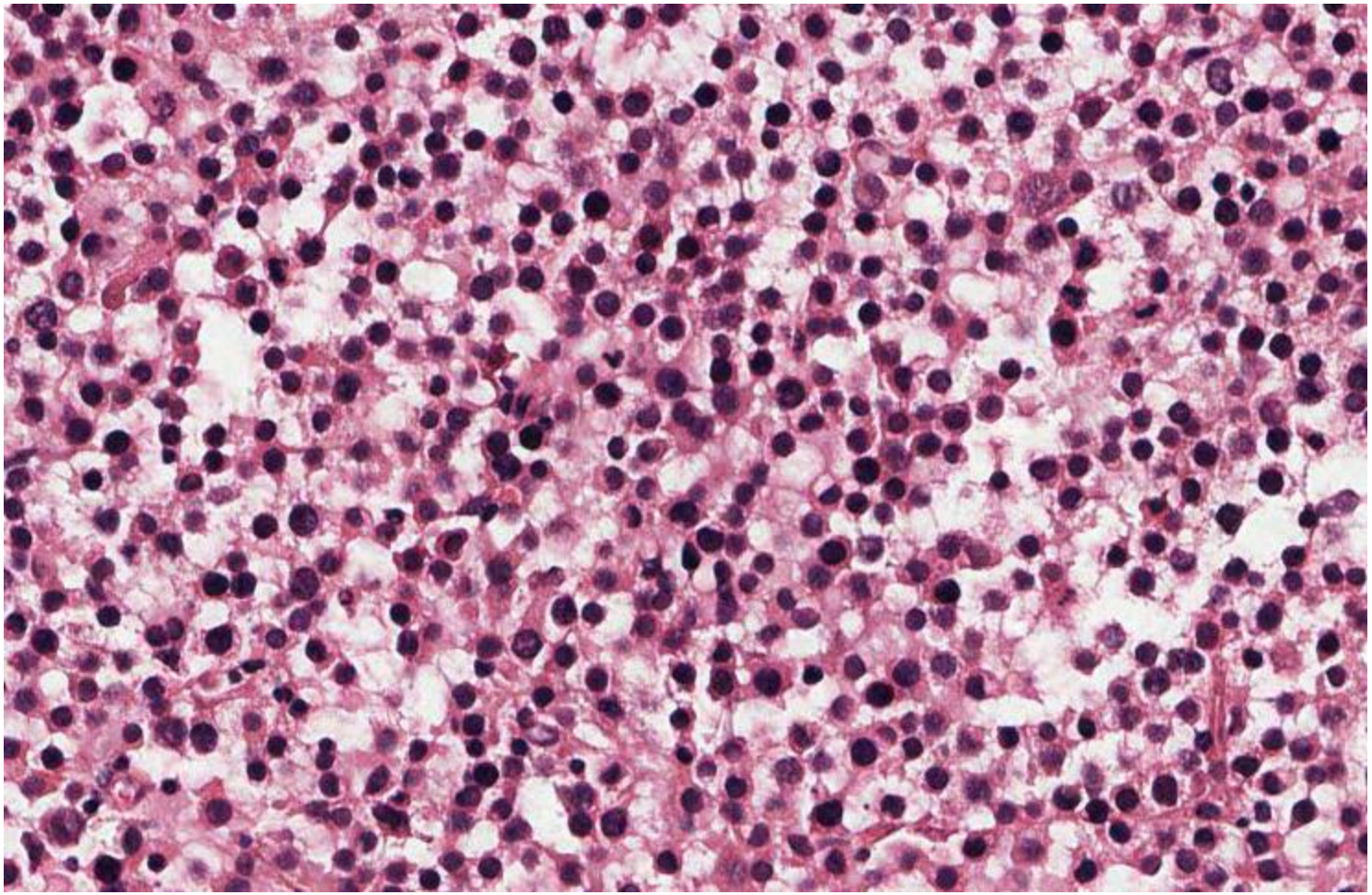
Case 5

- **Skin, arm - Neurofibroma**

Case 6

M66, testicular mass





Case 6

- **Description**
  - *This is a tumour composed of nests and sheets of cells with round nuclei, prominent nucleoli and delicate cytoplasm. There is no evidence of a prominent lymphocytic component. The tumour appears confined to the testis and vascular invasion is not seen. There is no evidence of IGCN.*

Case 6

- **Interpretation**
  - *This is a spermatocytic seminoma*
  - *This is a malignant germ cell tumour*
  - *This is a malignant epithelioid neoplasm*

Case 6

- **Differential diagnosis**
  - *Main one is classical seminoma*
    - *Spermatocytic seminomas lack lymphocyte-rich fibrous bands and usually affect older men*
    - *They are also not associated with IGCN*
    - *Can sort out on immuno if unsure*

Case 6

- **Extra investigations**
  - *Immuno*
    - *Spermatocytic seminoma*
      - *C-KIT & OCT 3/4 +ve*
      - *PLAP –ve*
    - *Classical seminoma*
      - *C-KIT, OCT 3/4 , PLAP +ve*

Case 6

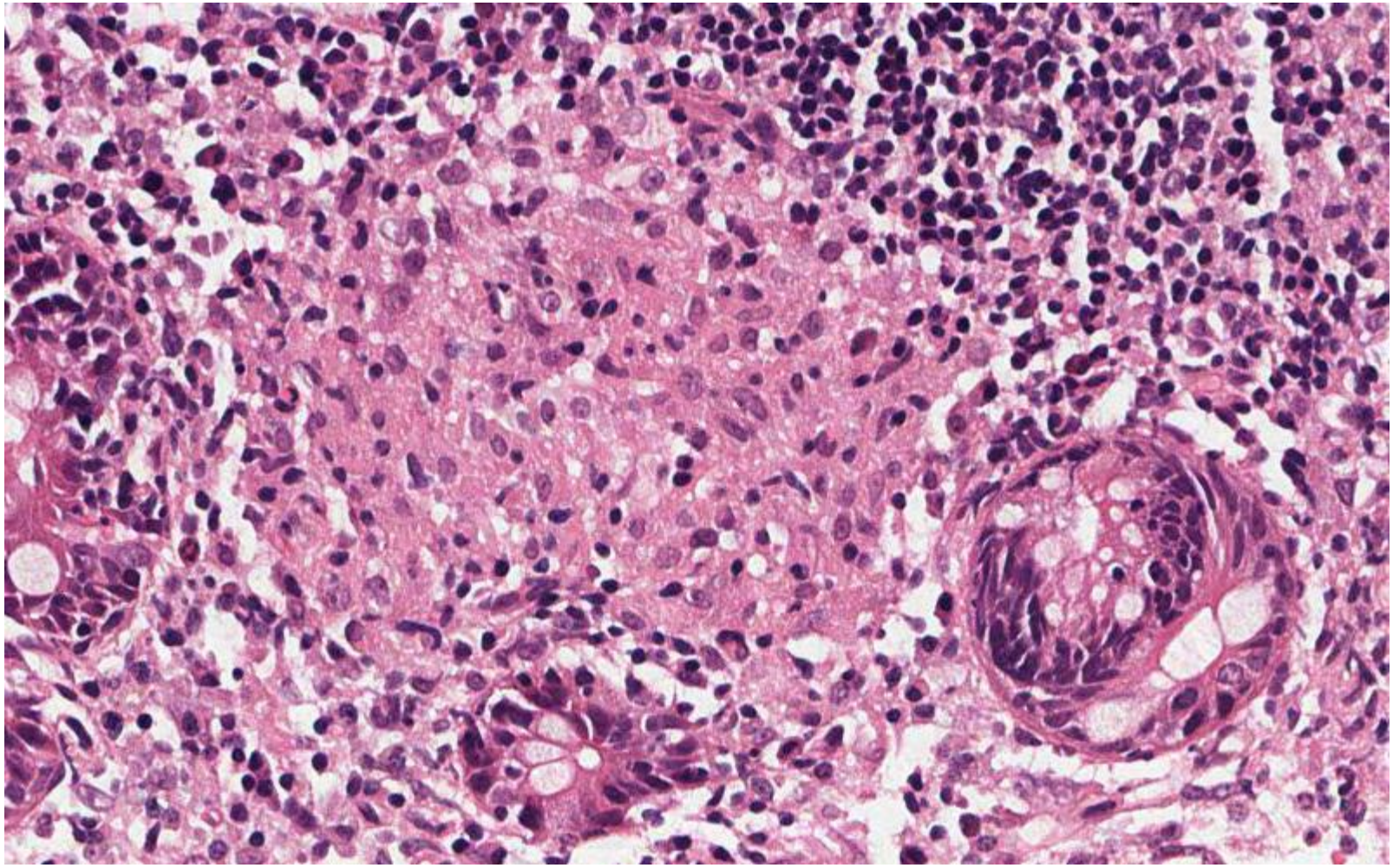
- **Clinico-pathological correlation**
  - Older men
  - Excellent prognosis
  - Excision curative
  - Stage and discuss at Urological MDT

Case 6

- **Testicular mass – Spermatocytic seminoma**

Case 7

M18, diarrhoea, colorectal biopsies



Case 7

- **Description**
  - *Biopsies of large intestinal mucosa showing mild crypt distortion, non-caeseating granulomas within the lamina propria and a mild increase in lamina propria cellularity*
  - *No evidence of active inflammation, ulceration, dysplasia or malignancy*

Case 7

- **Interpretation**
  - *This is a granulomatous colitis*

Case 7

- **Differential diagnosis**
  - Necessary in this case
    - Crohn’s disease
    - Mycobacterial infection
    - Fungal infection
    - Sarcoidosis
    - Reaction to tumour

Case 7

- **Extra investigations**
  - ZN / fungal stains
  - Mycobacterial PCR

Case 7

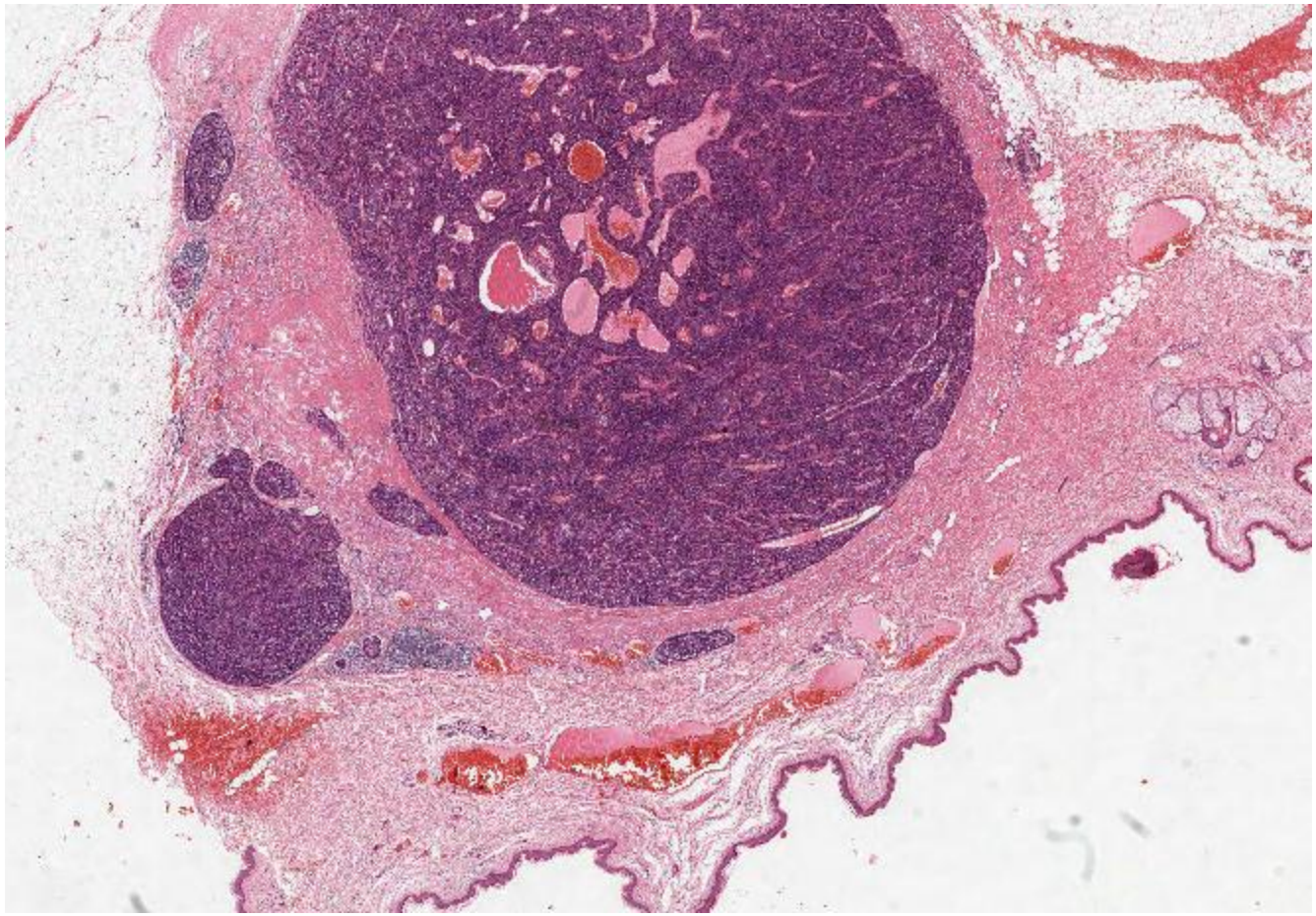
- **Clinico-pathological correlation**
  - Needs examination of targeted colorectal and ileal biopsies to investigate IBD
    - Crohn’s disease associated with skip lesions, fissuring

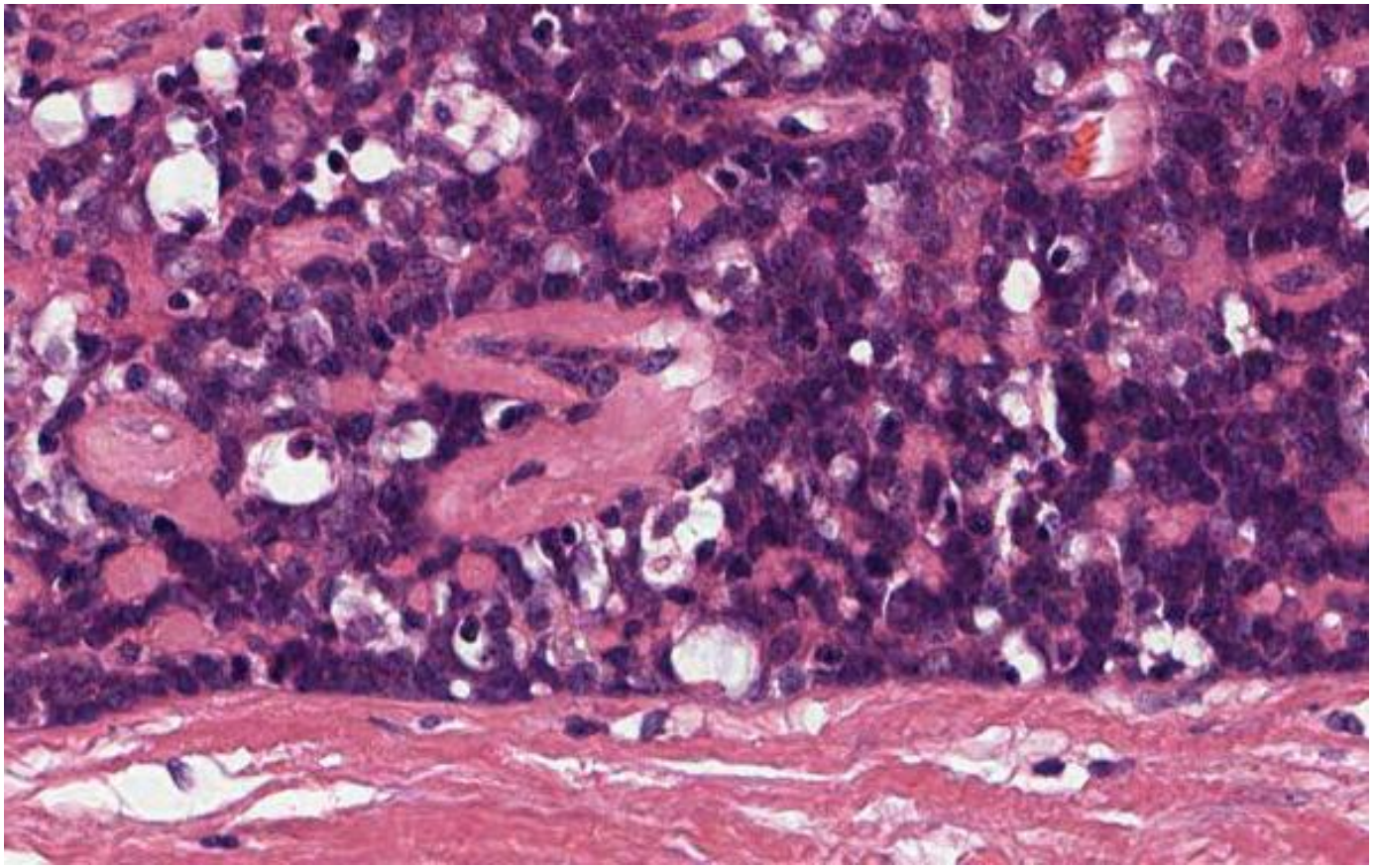
Case 7

- **Colorectal biopsies – Granulomatous colitis**

Case 8

F42, lesion on arm





Case 8

- **Description**
  - *This is a well-circumscribed, vascular, dermal lesion composed of small basaloid cells admixed with larger pale epithelial cells and lymphocytes. There is no epidermal connection. There are no features of malignancy.*
  - *This lesion appears excised in the plane of section examined*

Case 8

- **Interpretation**
  - *This is an eccrine spiradenoma*
  - *This is a benign eccrine tumour*
  - *This is a benign adnexal tumour*
  - *This is a benign tumour*

Case 8

- **Differential diagnosis**
  - *Reasonable to include some other adnexal tumours if you're not sure*
    - *Cylindroma*
    - *Acrospiroma (Dermal duct tumour)*

Case 8

- **Extra investigations**
  - *No relevant that I can think of*

Case 8

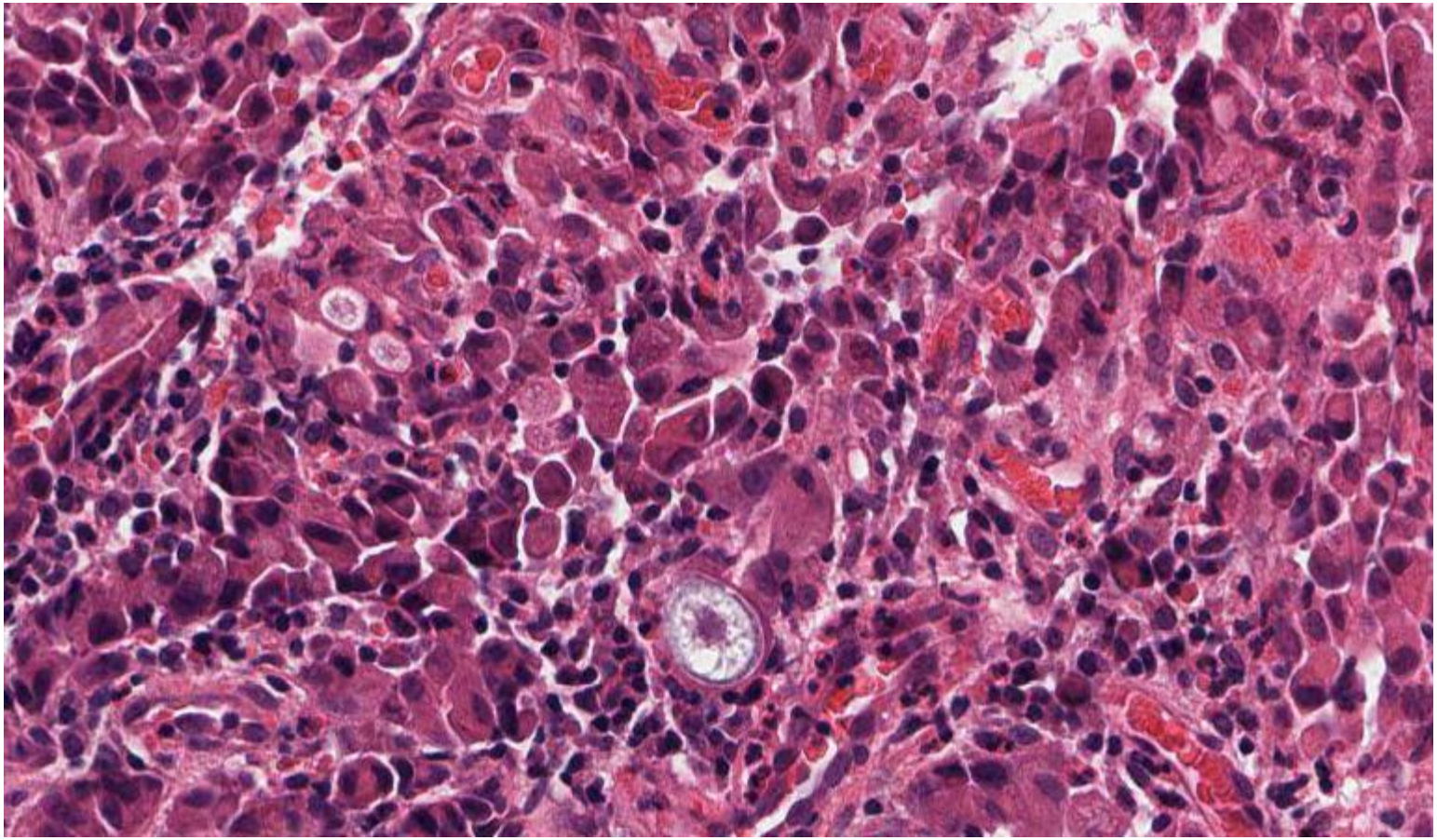
- **Clinico-pathological correlation**
  - Usually solitary lesions
  - Classically painful (ANGEL)
  - Malignant transformation rare
  - Excision curative
  - Multiple tumours associated with Brooke-Spiegler syndrome

Case 8

- **Lesion on arm – Eccrine spiradenoma**

Case 9

M38, nausea and vomiting, gastric biopsies



Case 9

- **Description**
  - *These are biopsies of fundic-type gastric mucosa showing diffuse infiltration of the lamina propria by malignant tumour cells*
  - *The cells show displaced nuclei and occasional cytoplasmic vacuolation (“signet-ring” morphology)*
  - *No vascular invasion identified*
  - *No evidence of background dysplasia*

Case 9

- **Interpretation**
  - *This is poorly-differentiated (signet-ring) adenocarcinoma*
  - *This is a malignant epithelioid neoplasm*

Case 9

- **Differential diagnosis**
  - *Poorly differentiated adenocarcinoma*
  - *Lymphoma*
  - *Melanoma*

Case 9

- **Extra investigations**
  - PAS stain - +ve in vacuoles
  - Immuno
    - Cytokeratin (CK 7) and CEA positive
    - CK20, CD45, S100 and Melan-A negative

Case 9

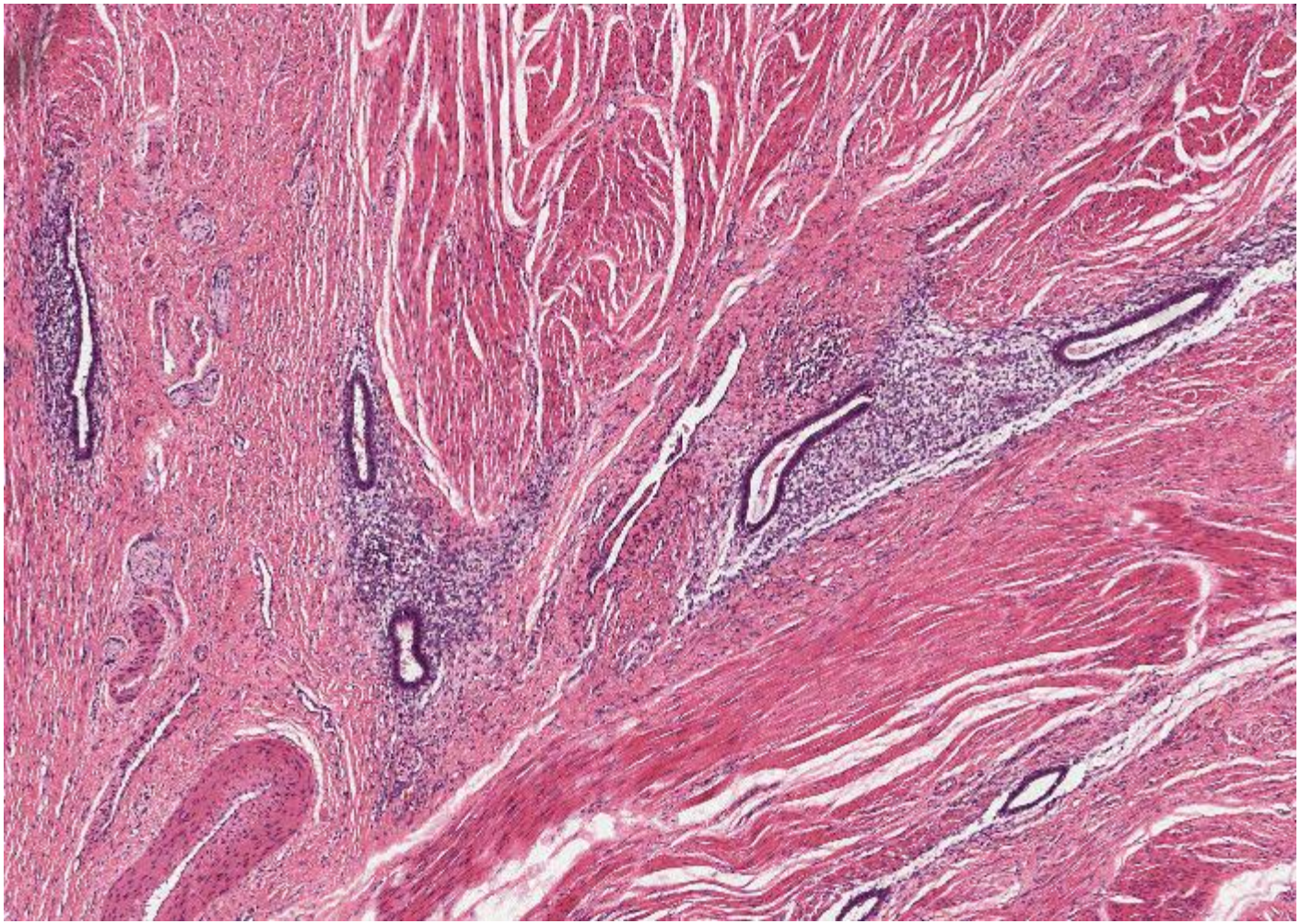
- **Clinico-pathological correlation**
  - Requires MDT correlation
  - Classical “linitis plastica” picture at endoscopy
  - May be resectable depending on extent of spread
  - Overall poor prognosis
  - New evidence of role of Trastuzumab in Her-2 positive gastric cancer

Case 9

- **Gastric biopsies – Poorly differentiated (signet ring) adenocarcinoma**

Case 10

F28, haematuria and pelvic pain, bladder biopsies



Case 10

- **Description**
  - *Bundles of smooth muscle infiltrated by endometrial glands and stroma*
  - *Foci of extravasated red blood cells and pigment-laden macrophages*
  - *No evidence of atypia or necrosis*
  - *No in-situ disease*

Case 10

- **Interpretation**
  - *This is endometriosis*

Case 10

- **Differential diagnosis**
  - *No others of note*

Case 10

- **Extra investigations**
  - *Not necessary, but can state that endometrial foci would be CD10 and ER positive*

Case 10

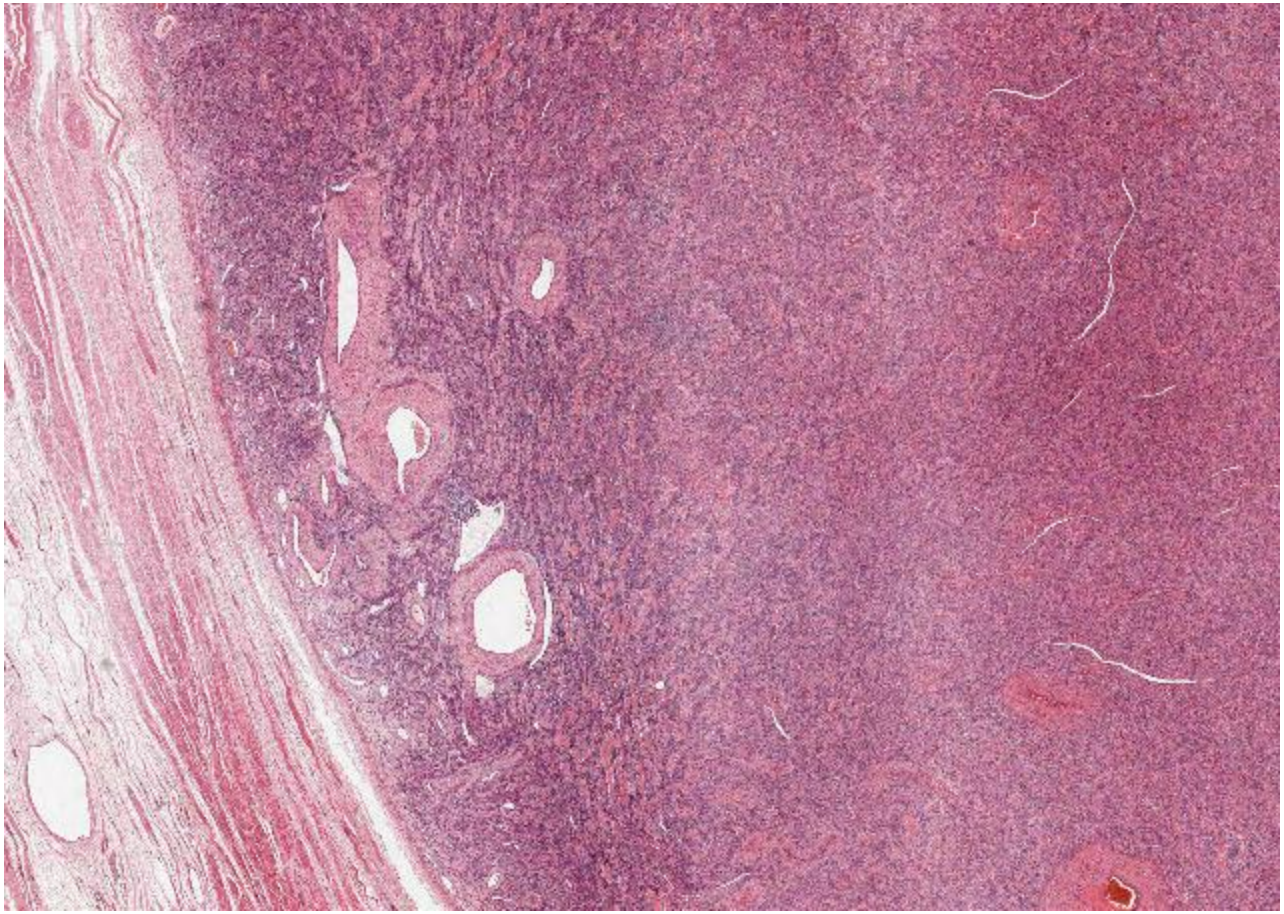
- **Clinico-pathological correlation**
  - Endometriosis often multifocal (cervix, Pouch of Douglas, ovaries)
  - Increased risk of infertility
  - Treatment involves hormones (COCP, coil) or surgical
  - Usually disappears post-menopause

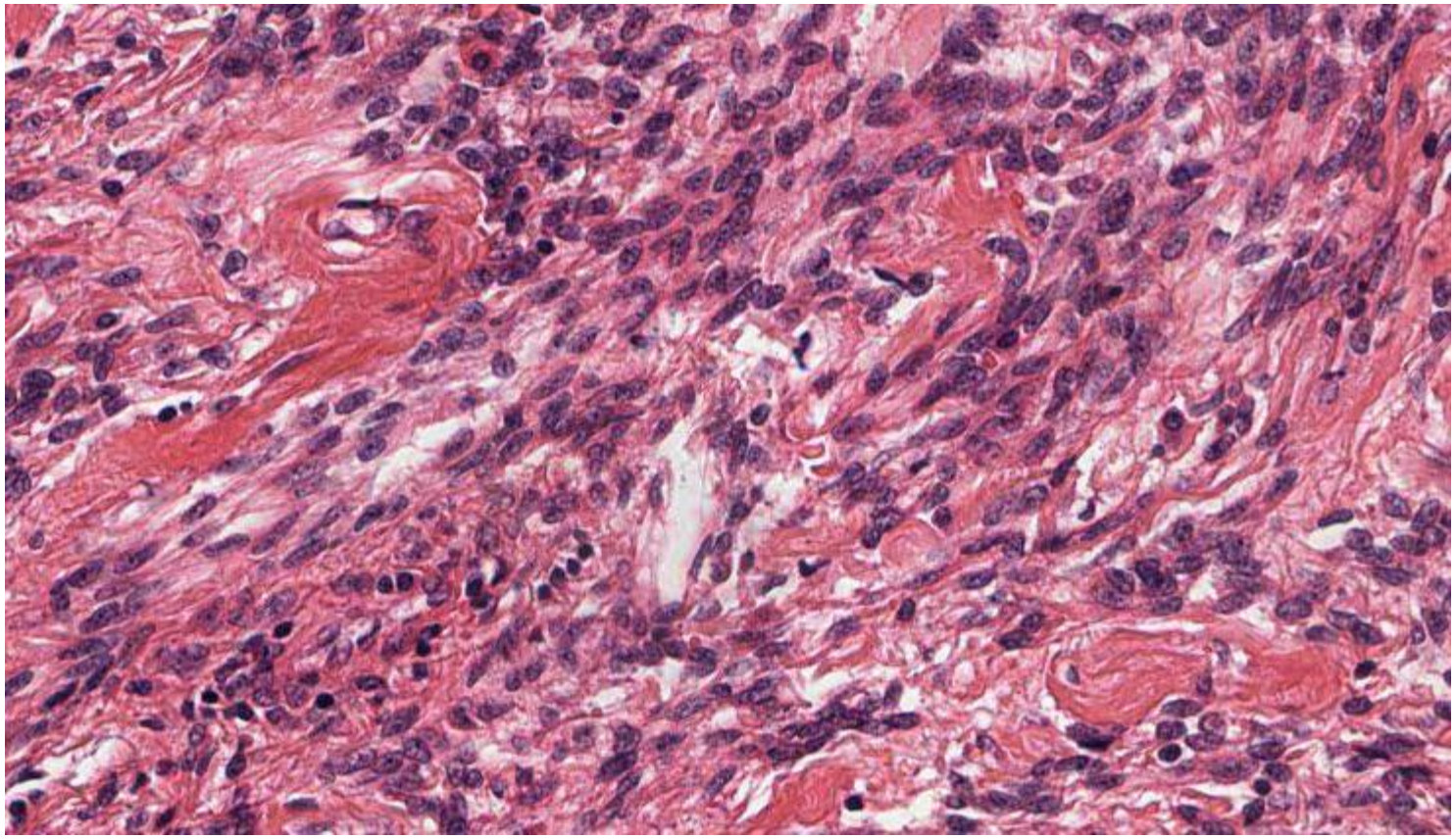
Case 10

- **Bladder biopsies - Endometriosis**

Case 11

F61, hysterectomy. Lesion in anterior myometrium





Case 11

- **Description**
  - *Well-circumscribed cellular lesion composed of spindle cells with cigar-shaped nuclei*
  - *Minimal nuclear atypia, no increase in mitotic activity and no necrosis*
  - *Smooth, regular interface with surrounding tissue*

Case 11

- **Interpretation**
  - *This is a cellular leiomyoma*
  - *This is a leiomyoma*
  - *This is a benign smooth muscle tumour*
  - *This is a smooth muscle tumour*

Case 11

- **Differential diagnosis**
  - *Cellular leiomyoma*
  - *Leiomyosarcoma*
  - *STUMP*

Case 11

- **Extra investigations**
  - *Correlate with macroscopic appearance*
  - *Needs extensive sampling, particularly around the edges of the lesion*
    - *Search for areas of increased mitotic activity, necrosis, infiltrative border*
  - *Can confirm smooth muscle origin with SMA, desmin, H-caldesmon*
  - *Ki67 may be useful*

Case 11

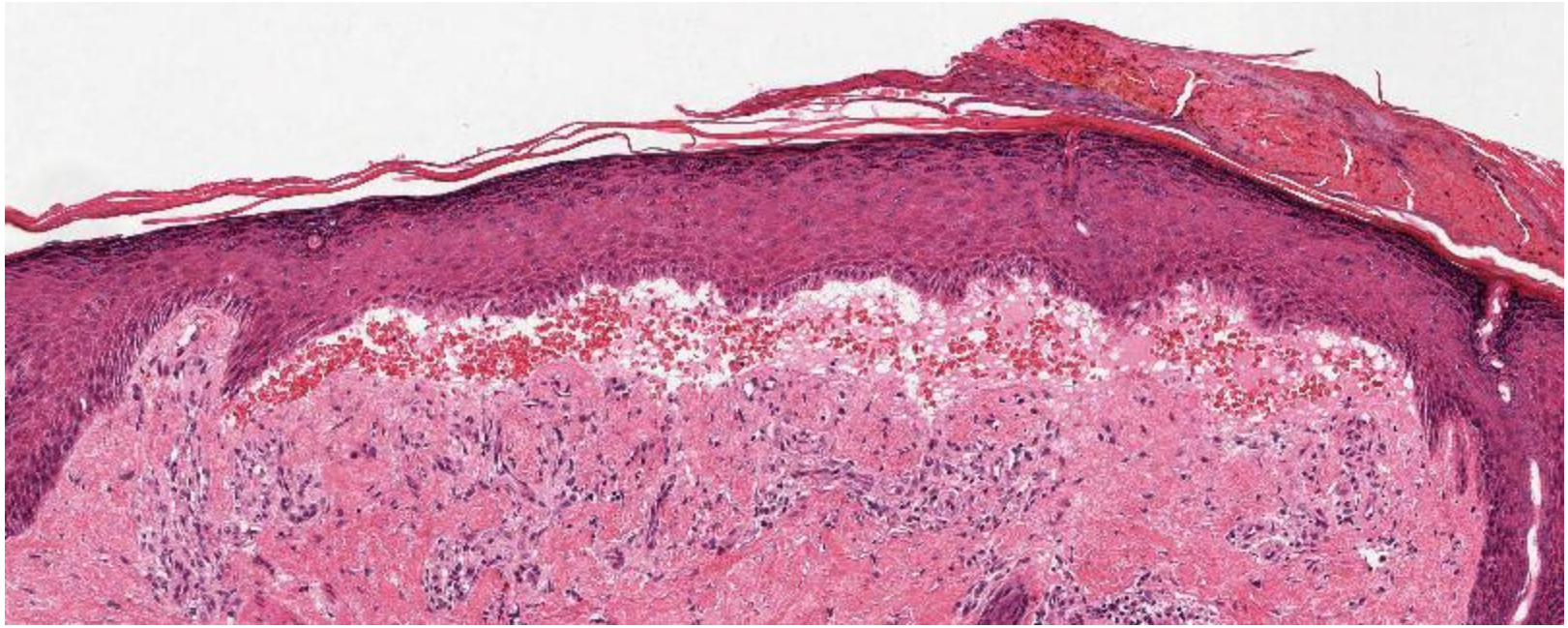
- **Clinico-pathological correlation**
  - *Correlate with imaging – any suspicious ultrasound features?*
  - *Cellular leiomyomas are benign*
  - *Excision curative*

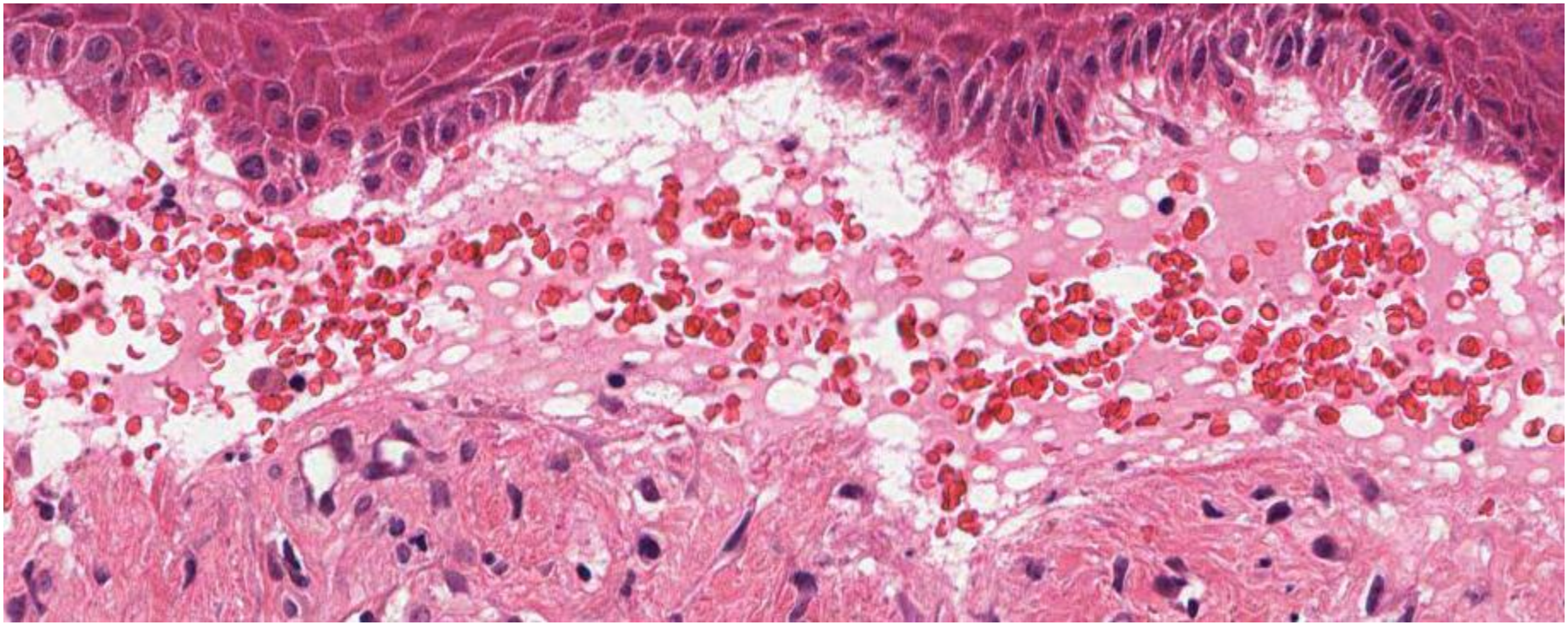
Case 11

- **Uterus – Cellular leiomyoma**

Case 12

F30, rash on arms. IgA positive on immunofluorescence studies





Case 12

- **Description**
  - *Skin with subepidermal clefting and effacement of the dermal papillae*
  - *Blister filled with blood, proteinaceous fluid, inflammatory cells*
  - *Fibrin on base of blister*
  - *No evidence of neoplasia*

Case 12

- **Interpretation**
  - *This is an inflammatory blistering process*

Case 12

- **Differential diagnosis**
  - *Dermatitis herpetiformis*
  - *Linear IgA disease*
  - *Bullous SLE*
  - *Bullous pemphigoid / EBA*
    - *These are NOT supported by the IMF*
    - *Only possible DDs if IMF not present*

Case 12

- **Extra investigations**
  - *IMF main one, already provided*
    - *Usually patchy and granular along BM in DH*
    - *Deposits may also be seen in the dermis (in DH)*

Case 12

- **Clinico-pathological correlation**
  - *Essential in this case*
  - *Discuss history with clinicians*
    - *? Coeliac disease (Dermatitis Herpetiformis)*
    - *? Medication history (Linear IgA disease)*
    - *? Previous history of SLE or autoimmune disease*

Case 12

- **Skin, arm – Favour dermatitis herpetiformis, see text**

Summary – Short Surgicals

- Stick to a standard format
- Practise it, over and over again, on any case
- Work on degree of certainty
  - If you're prepared, you'll be certain on around 75% of the questions
  - If uncertain take a step back, and keep to the structured answer
- All this of course depends on good background microscopy skills

Frozen Sections

Key tips

- Don’t panic
  - The frozen sections are often very straightforward
  - You have plenty of time
  - Your first impression is usually the right one
  - The Viva is usually quick and straightforward
  - You can probably only get away with deferring to paraffin once
  - Show initiative – if unsure, ask BMS to cut extra levels, show colleague

Common Cases

- Peritoneal nodules
  - Metastatic tumour
    - Ovarian
    - GI
  - Endometriosis

- Ureteric resection margins
  - CIS vs normal

Common Cases

- Granulomatous inflammation
  - Differentials
  - Clean the cryostat
- Resection margins
  - Skin
  - Bone
  - Pancreas
- Liver nodules
  - Met Ca
  - Von Meyenburg complex

Common Cases

- Lymph nodes
  - Benign / reactive
  - Don’t diagnose lymphoma
- Beware the non-diagnosable cases
  - Spindle cell lesions

Finally….

- Prepare well
  - Reading and slide exposure
- Practise over and over again
- Have a few days off before the exam
- Get a comfortable hotel
- Take chocolate and water into the exam
  - Not crisps
- Don’t dwell on things, at least until both days are over
- Go on holiday immediately afterwards

THANKS FOR LISTENING

Please give feedback

drpaulbennett@gmail.com