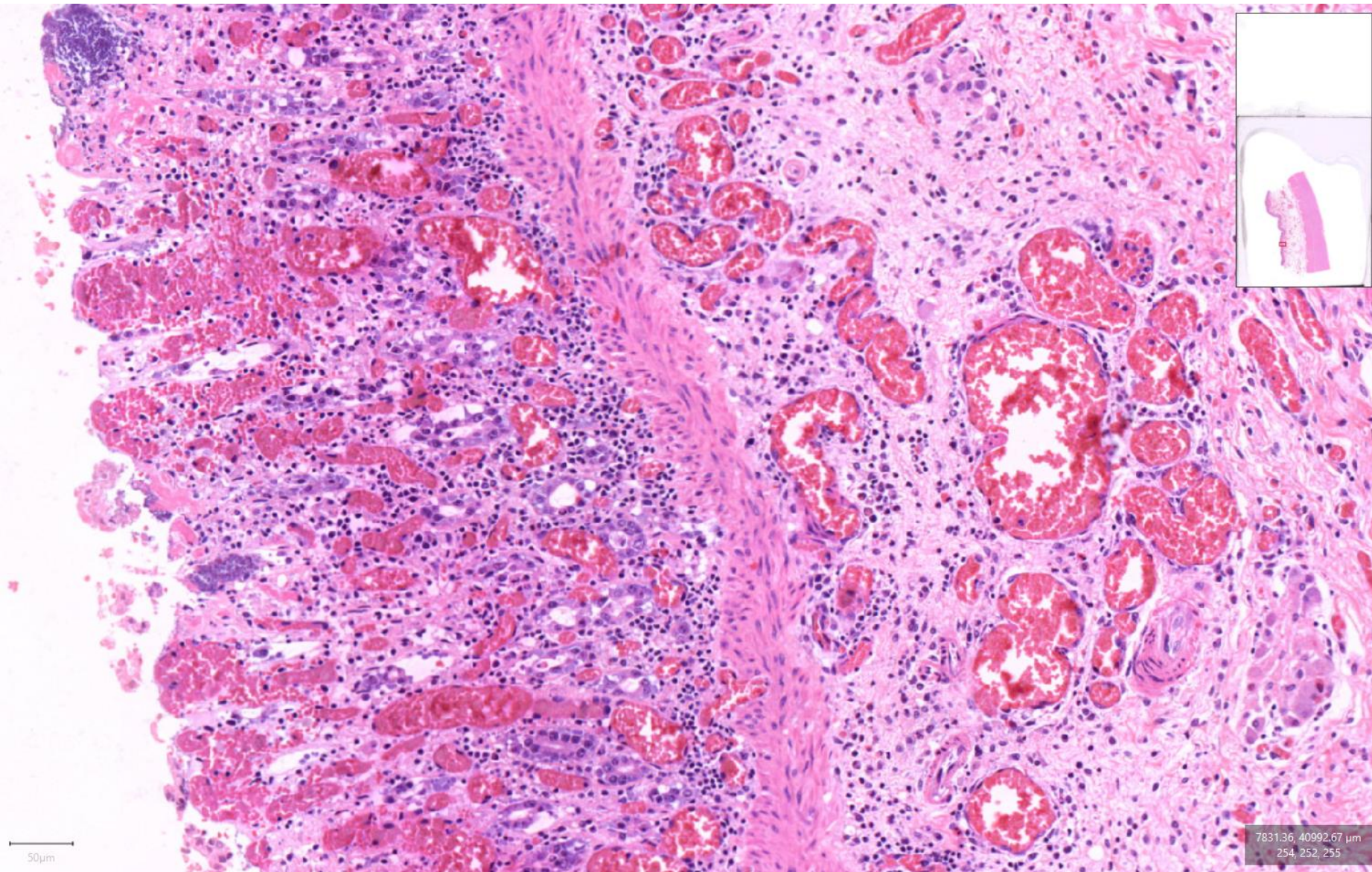


# Histology slide questions

You may also refer to the scanned slides for further detail.

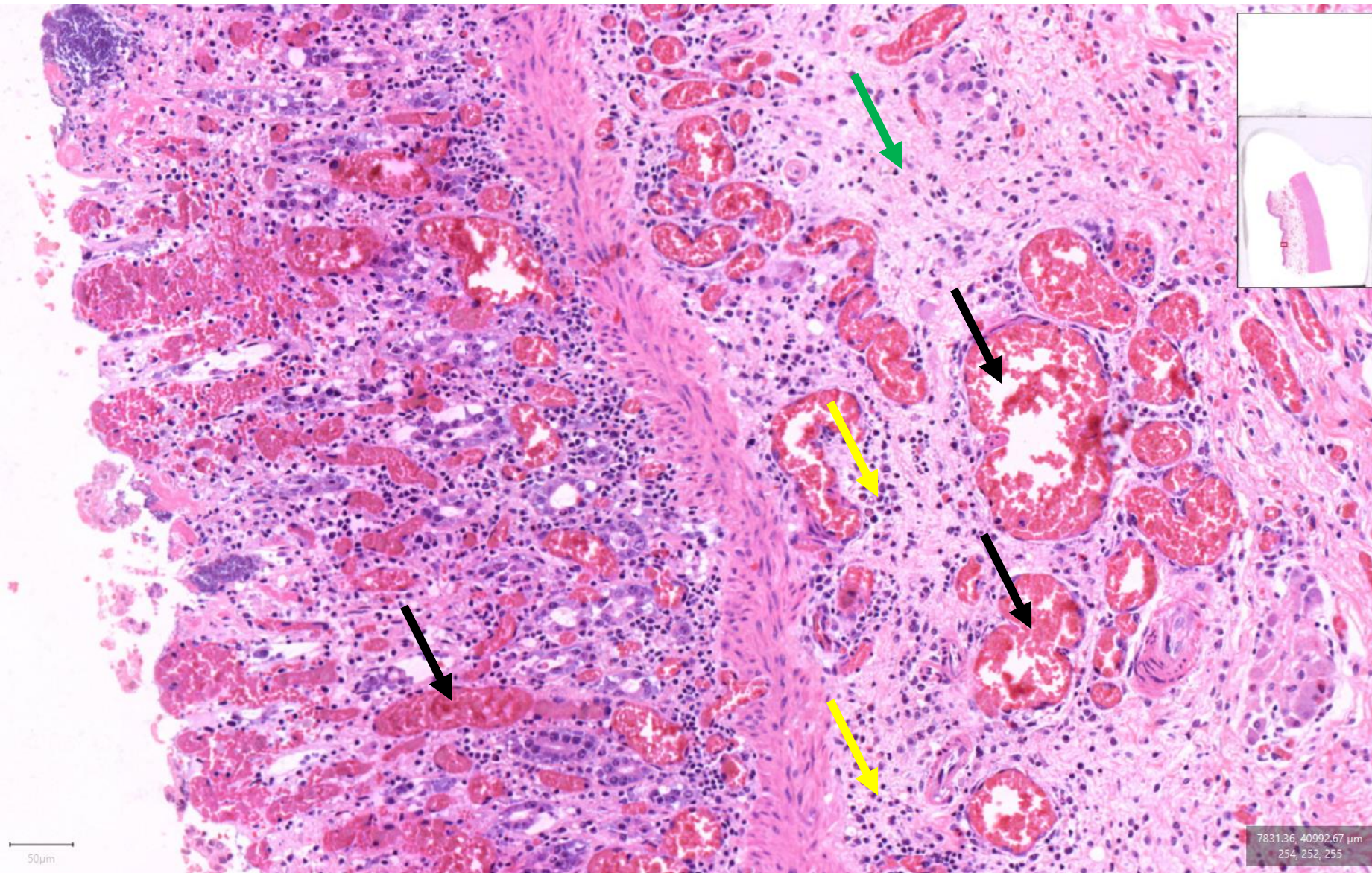
## Slide 1 – Enteritis in a horse



Q1. What features of acute inflammation can be seen in this image?



## Slide 1 – Enteritis in a horse

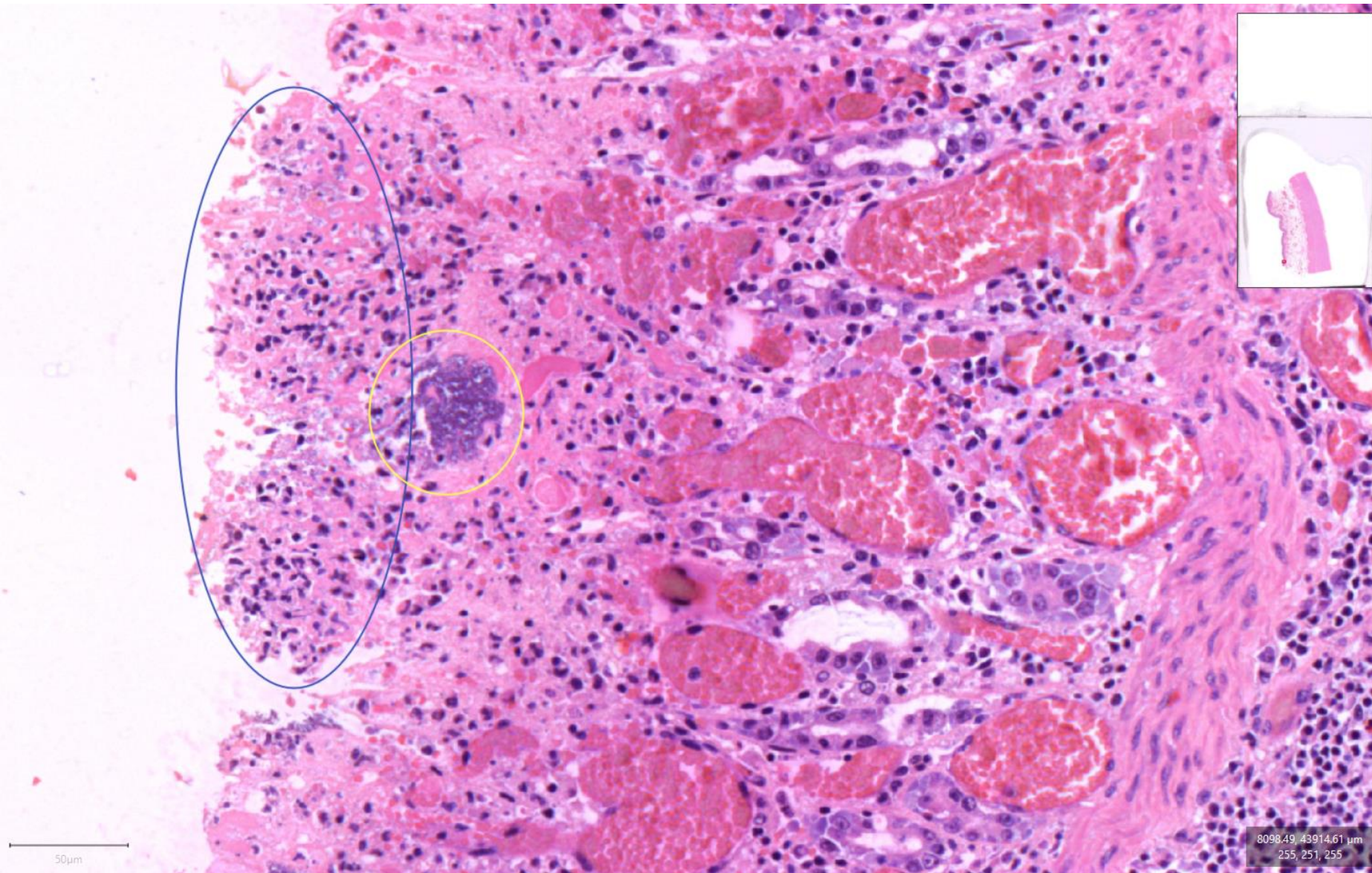


Q1. What features of acute inflammation can be seen in this image?

There is VASODILATION (examples indicated by black arrows), which increases the flow of blood to the inflamed area. This allows leukocytes to roll, attach and eventually exit the vessels (examples indicated by yellow arrows). The surrounding tissue is also paler than normal (green arrow) indicating oedema, which is responsible for swelling of tissues during acute inflammation.



## Slide 1 – Enteritis in a horse

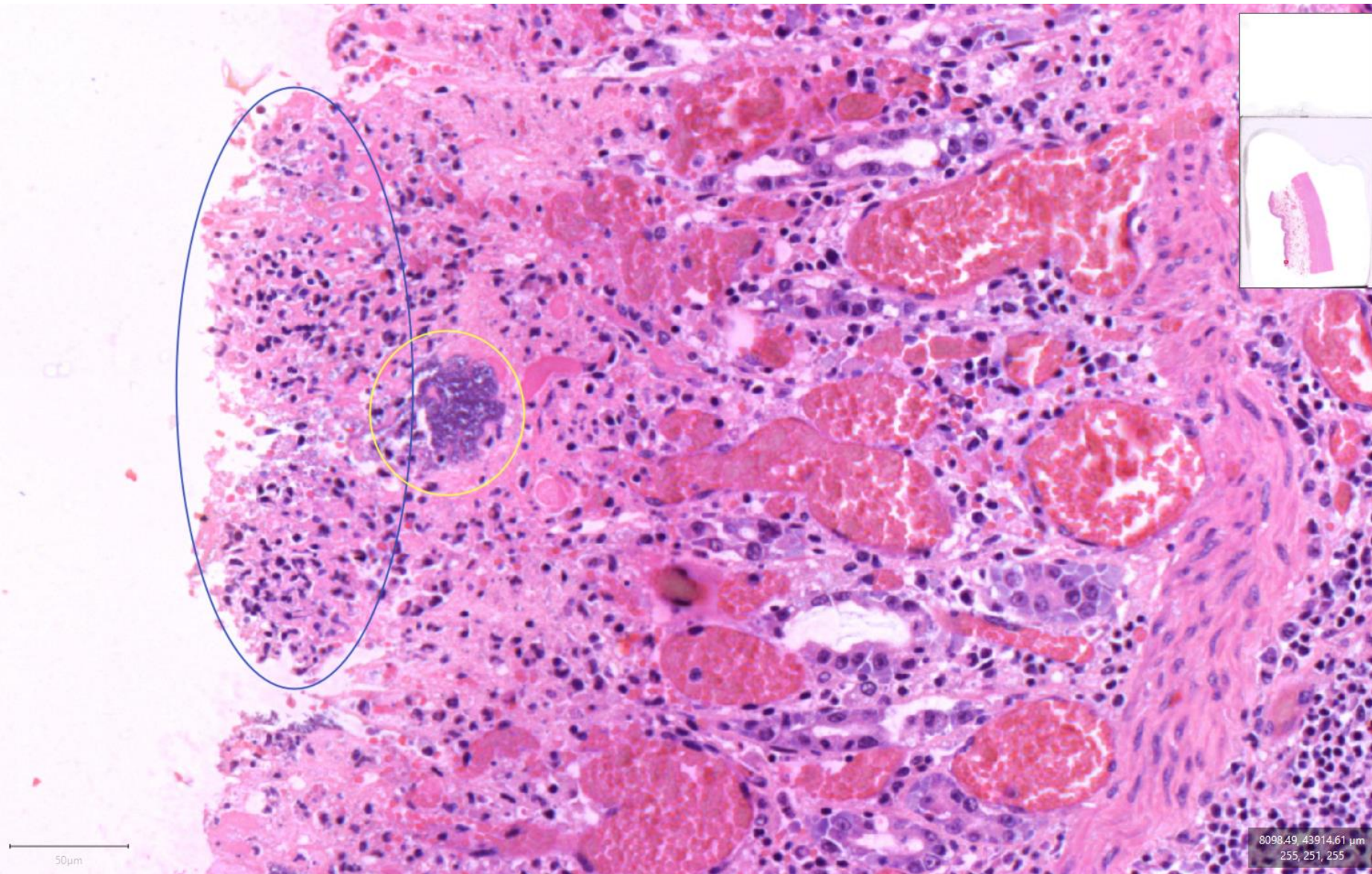


Q2. What are the blue (basophilic) bodies highlighted by the yellow circle?

Q3. What is the pink material highlighted by the blue circle? What purpose does this serve in inflammation?



## Slide 1 – Enteritis in a horse



Q2. What are the blue (basophilic) bodies highlighted by the yellow circle?

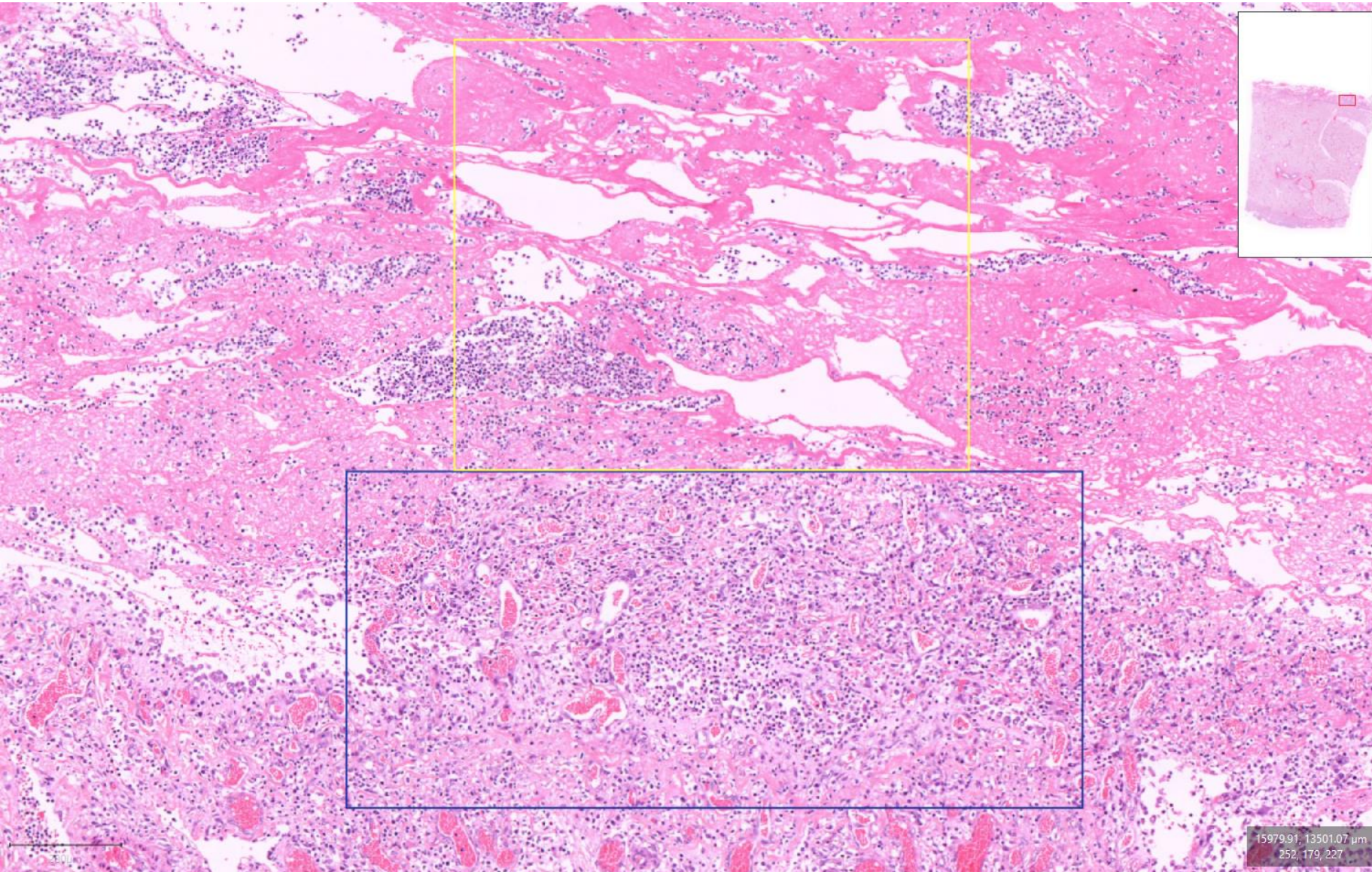
These are clusters of bacteria which are stimulating the inflammation. Bacteria are often hard to see individually, but in tissues will often group together in colonies.

Q3. What is the pink material highlighted by the blue circle? What purpose does this serve in inflammation?

The pink material is fibrin that has leaked from vessels and is coating the surface of the mucosa (gut lining). This traps organisms and can provide a scaffold for leukocytes and other cells. The blue fragments are neutrophils that have entered the fibrin, released toxic compounds such as free radicals, and then died.



## Slide 2 – Fibrinosuppurative pleuritis

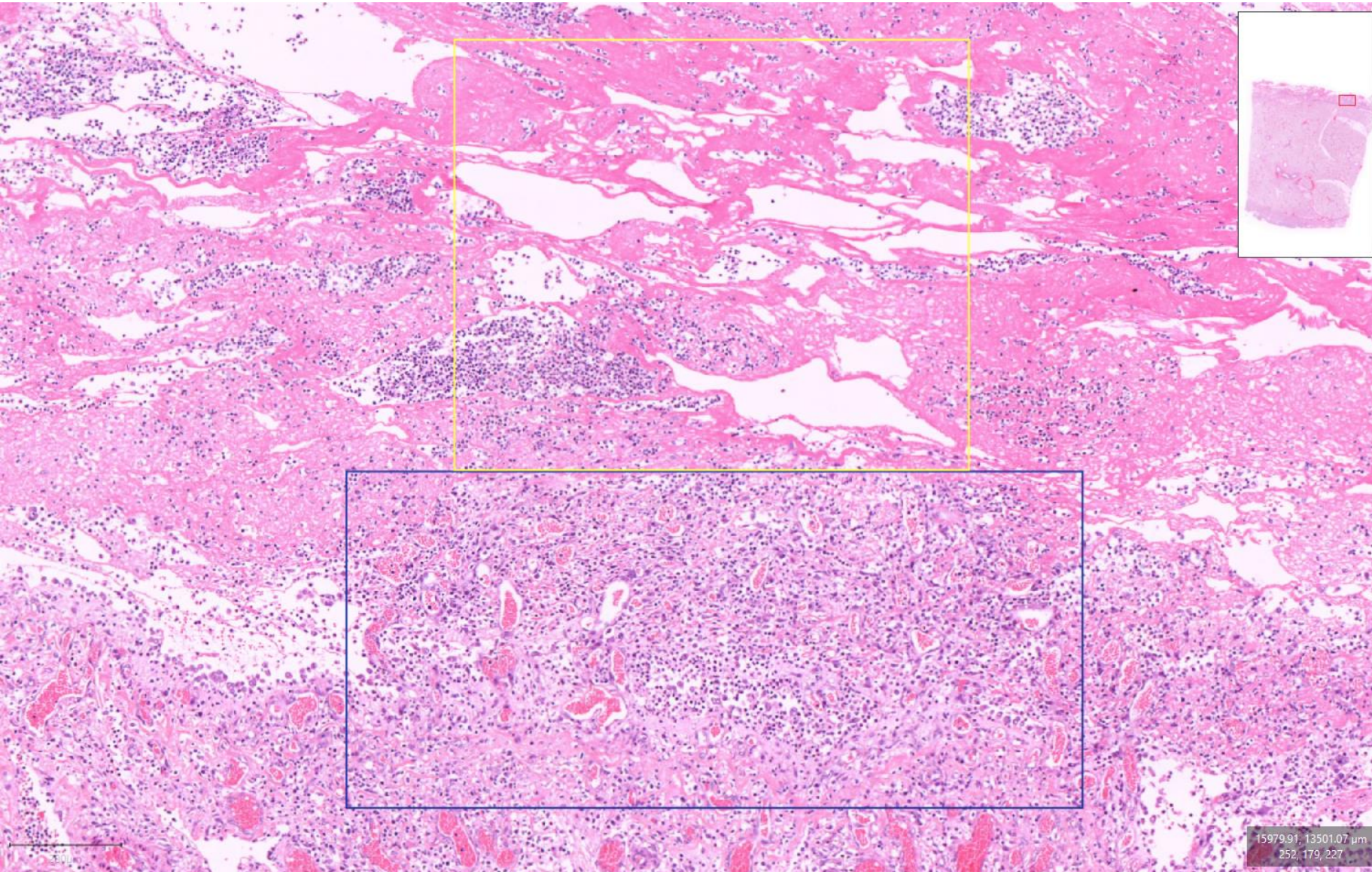


Q1. What is the material highlighted in the yellow box?

Q2. How does this relate to the tissue in the blue box?



## Slide 2 – Fibrinosuppurative pleuritis



Q1. What is the material highlighted in the yellow box?

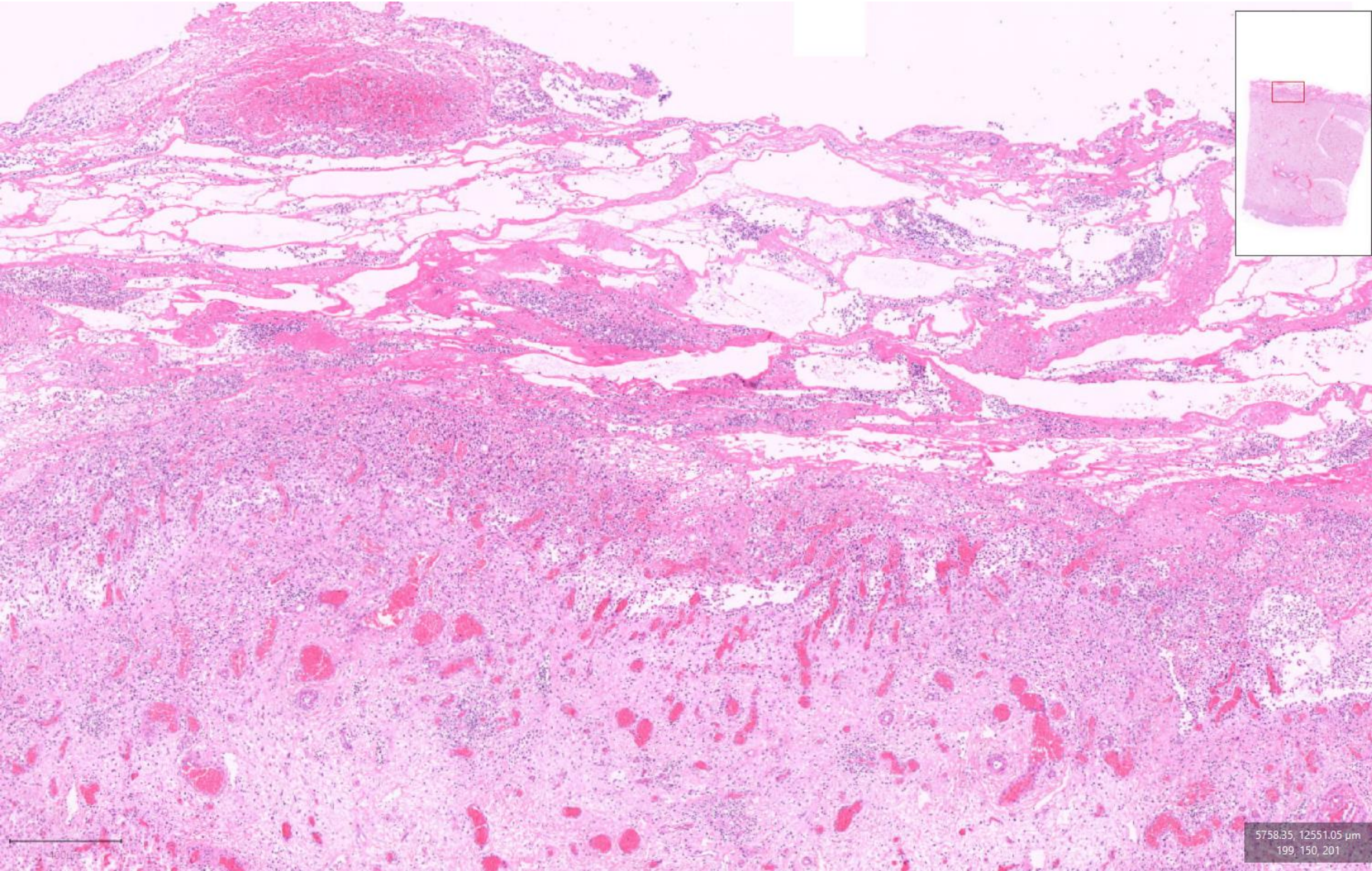
These are strands of fibrin. Fibrin organizes into strands over time, which you can see here. Also note the clusters of leukocytes embedded in the fibrin.

Q2. How does this relate to the tissue in the blue box?

This is early granulation tissue – you can see blood vessels growing towards the surface. Fibrin is a strong stimulus for granulation tissue formation, even when there is not a clear wound.



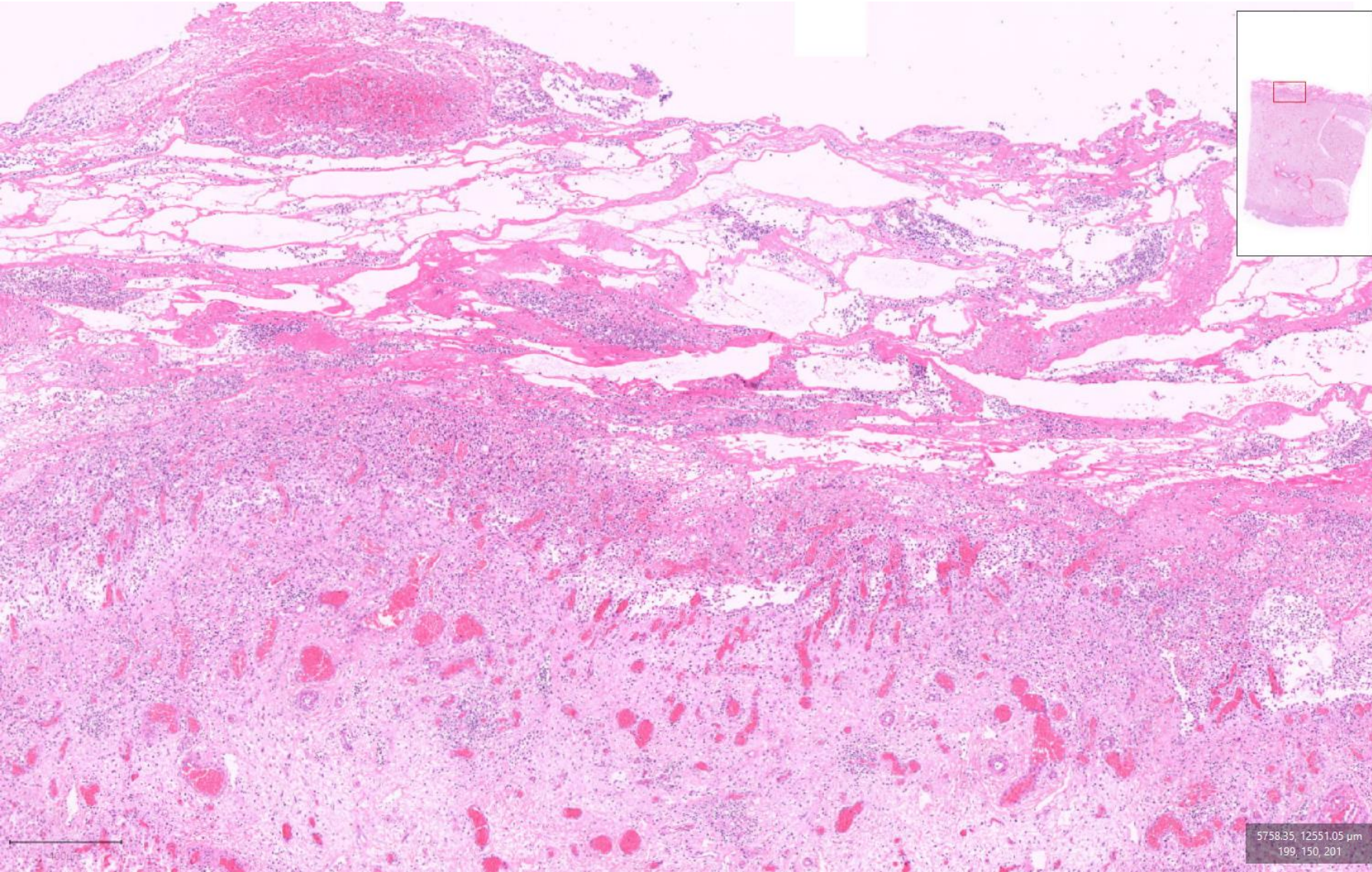
## Slide 2 – Fibrinosuppurative pleuritis



Q3. Suggest complications that may occur with healing in this case?



## Slide 2 – Fibrinosuppurative pleuritis

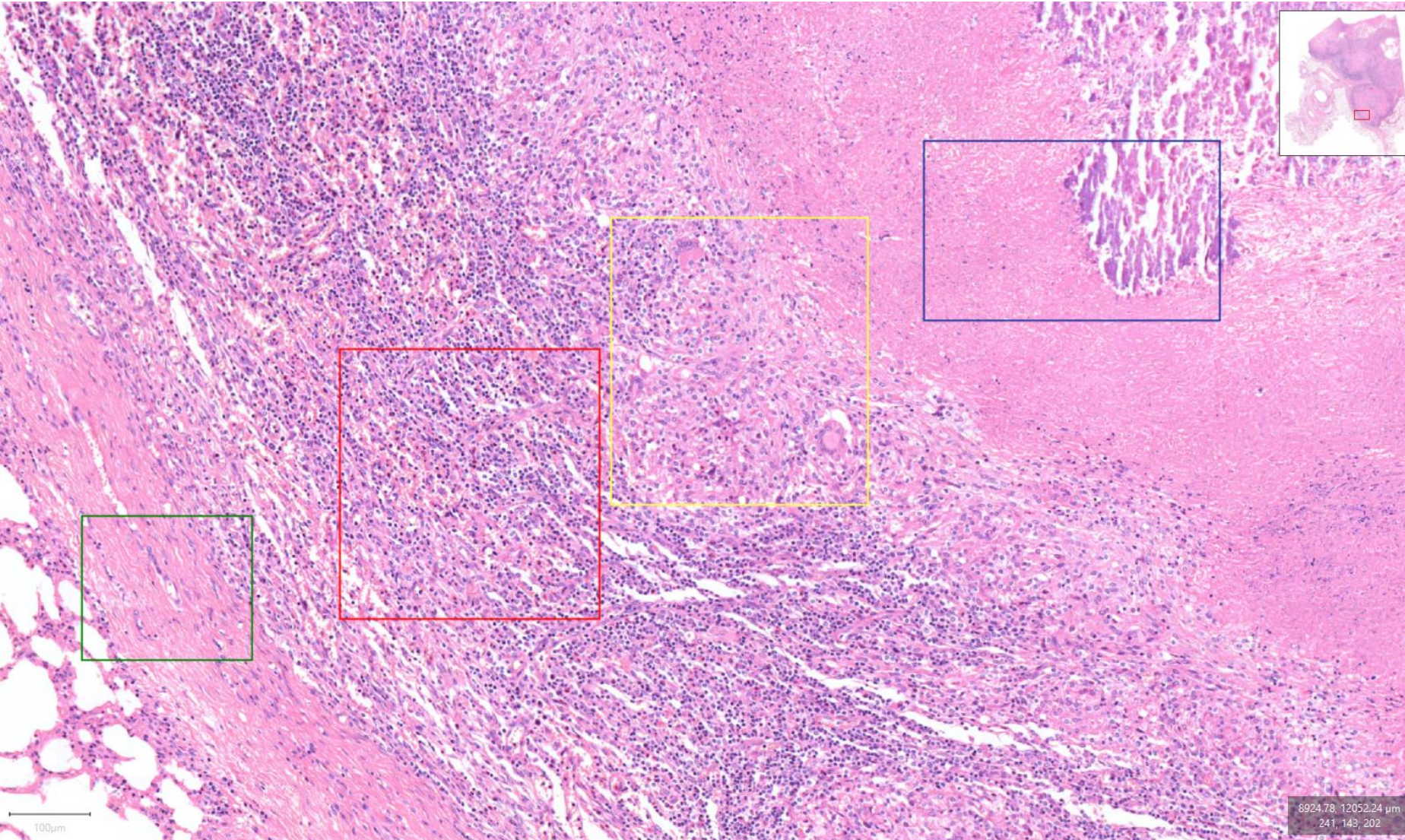


Q3. Suggest complications that may occur with healing in this case?

If the granulation tissue extends through the fibrin on the lung surface to the body wall, as this matures to fibrous connective tissue it may form an adhesion. This could restrict the ability of the lung to inflate and cause long-term breathing issues for this horse.



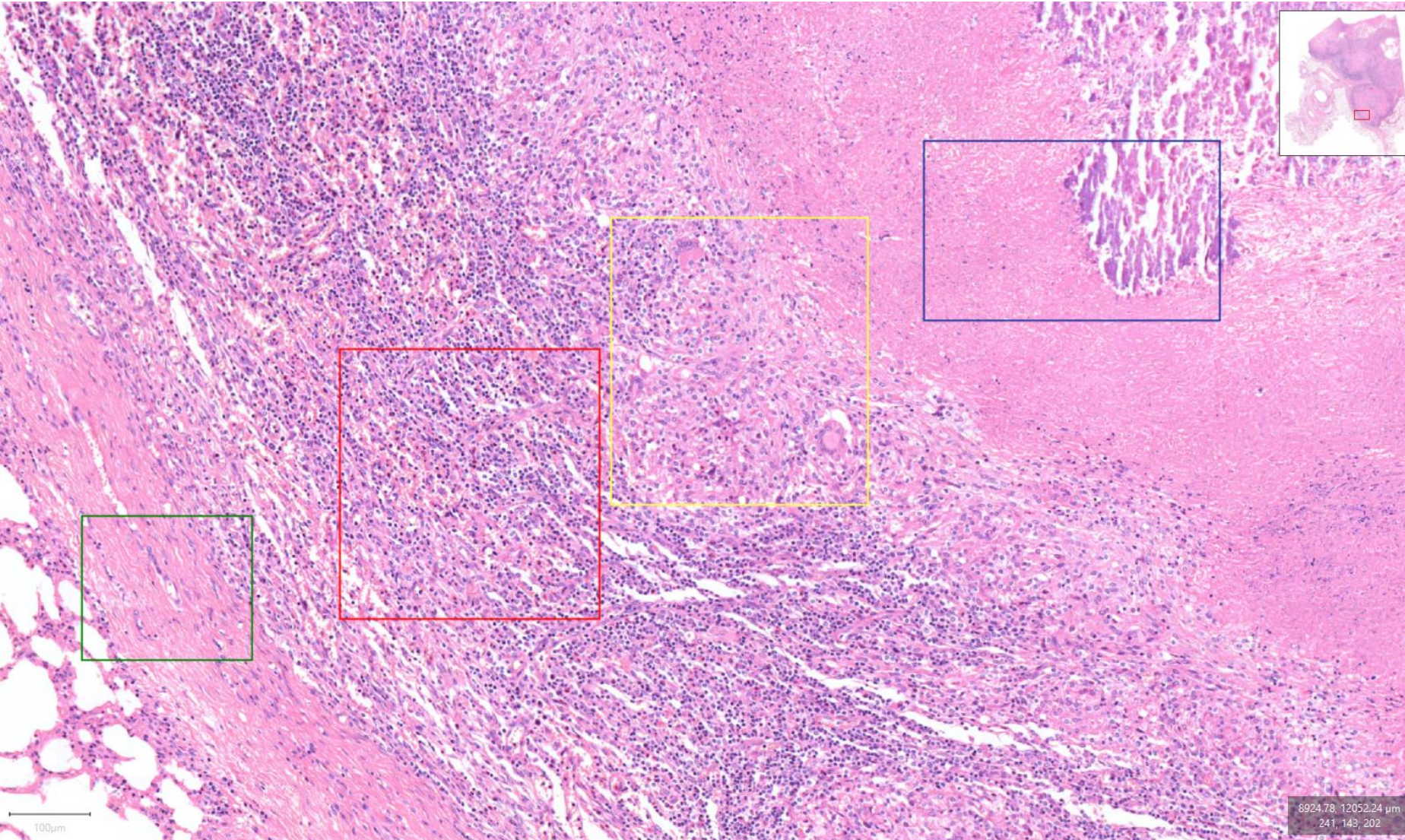
## Slide 3 – Bovine Tuberculosis



Q1. Explain what is highlighted in each of the coloured boxes in the granuloma wall pictured.



## Slide 3 – Bovine Tuberculosis



Q1. Explain what is highlighted in each of the coloured boxes in the granuloma wall pictured.

Blue box: This is an area of necrosis, which you can tell by the absence of cell detail. The blue material is mineralization, which sometimes occurs in areas of dead tissue. This would be cheesy or “caseous” on gross examination. You will learn more about necrosis next week.

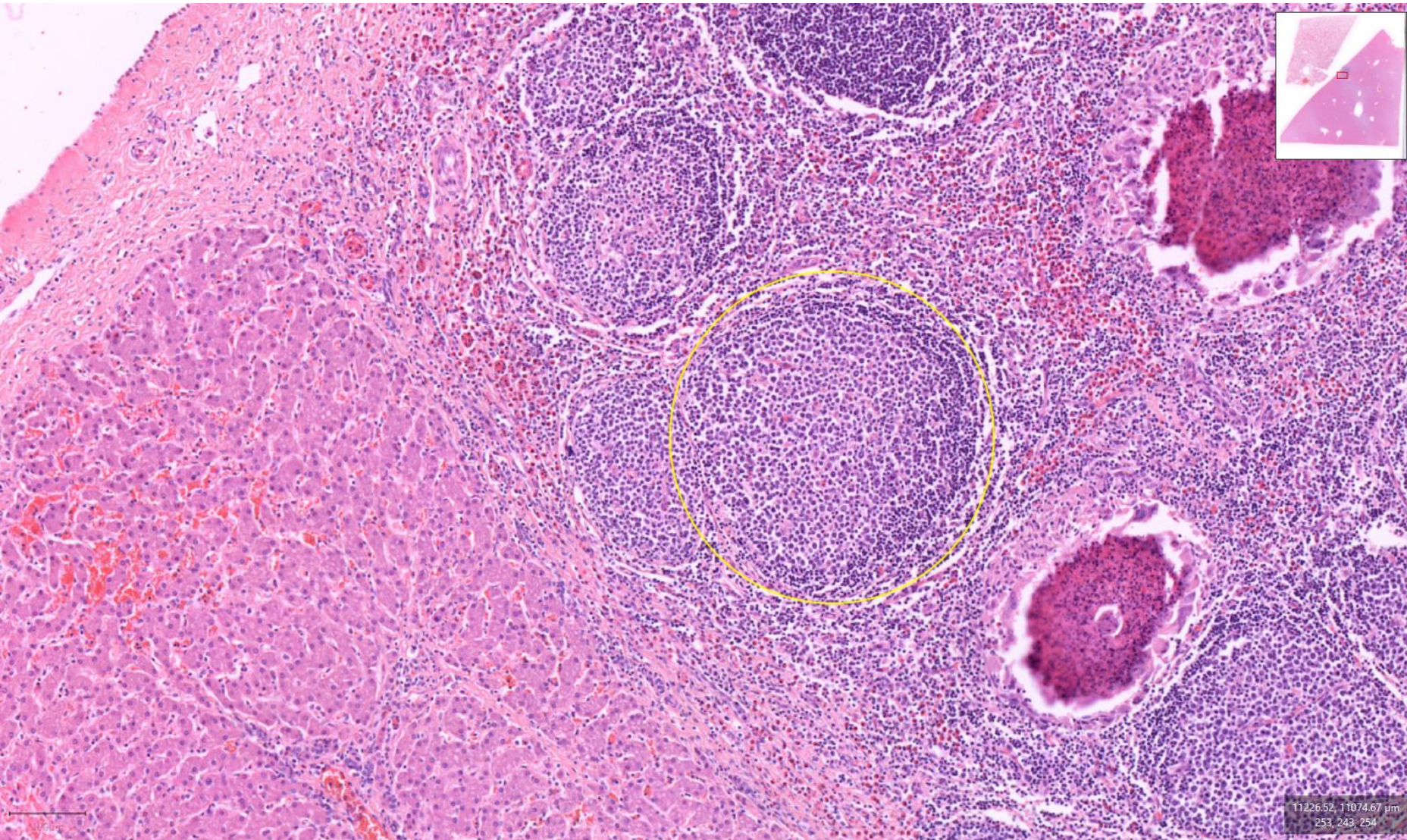
Yellow box: This is a layer of macrophages. You can see some giant cells embedded in this layer as well.

Red box: There are macrophages here, but also lots of lymphocytes (small cells with a dark nucleus), which are directing the immune response from afar.

Green box: This is a fibrous capsule that has formed around the granuloma, an attempt at healing that indicates this is a chronic process.



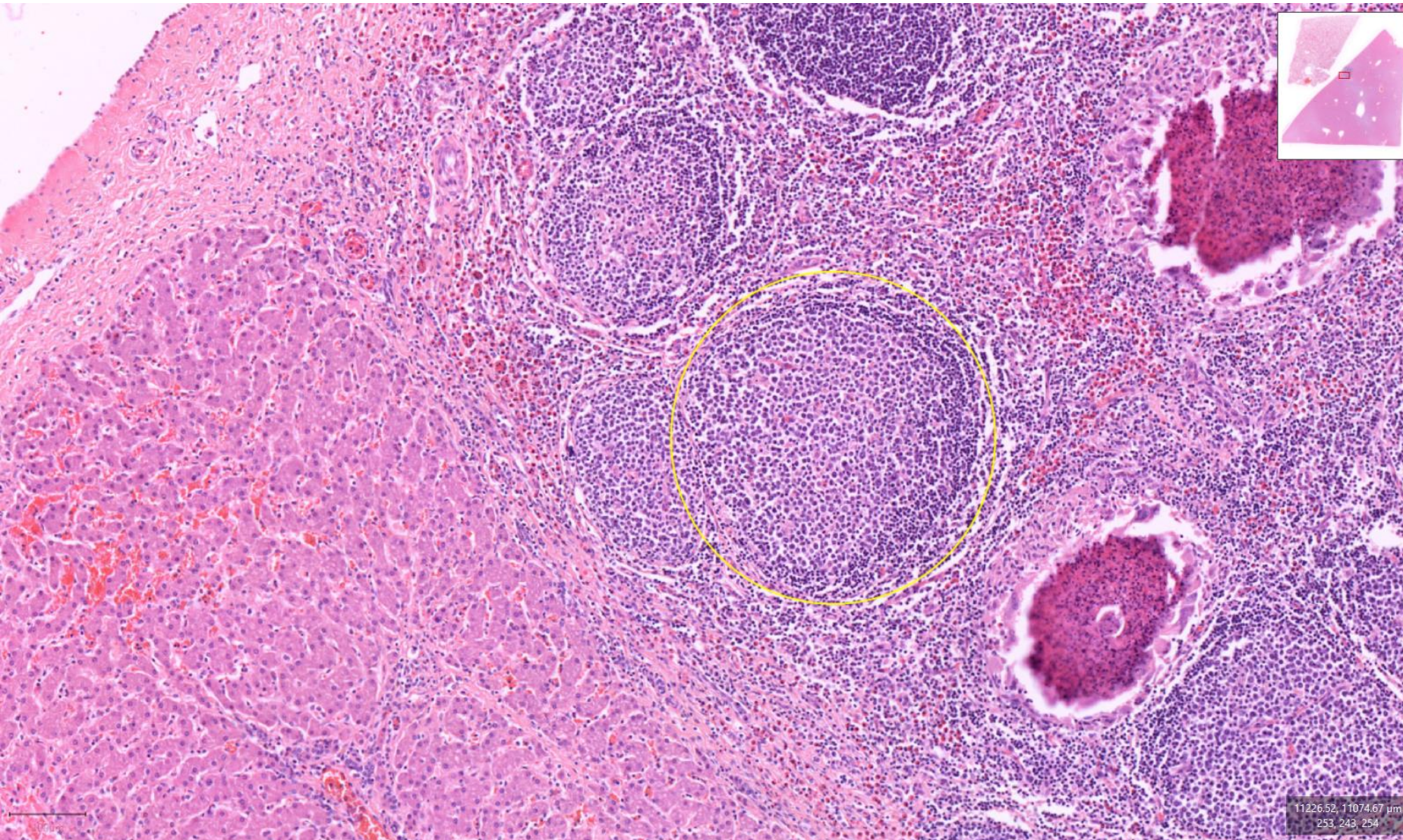
## Slide 4 – Focal eosinophilic hepatitis in a horse



Q1. What is the structure highlighted in yellow? What does its presence suggest?



## Slide 4 – Focal eosinophilic hepatitis in a horse

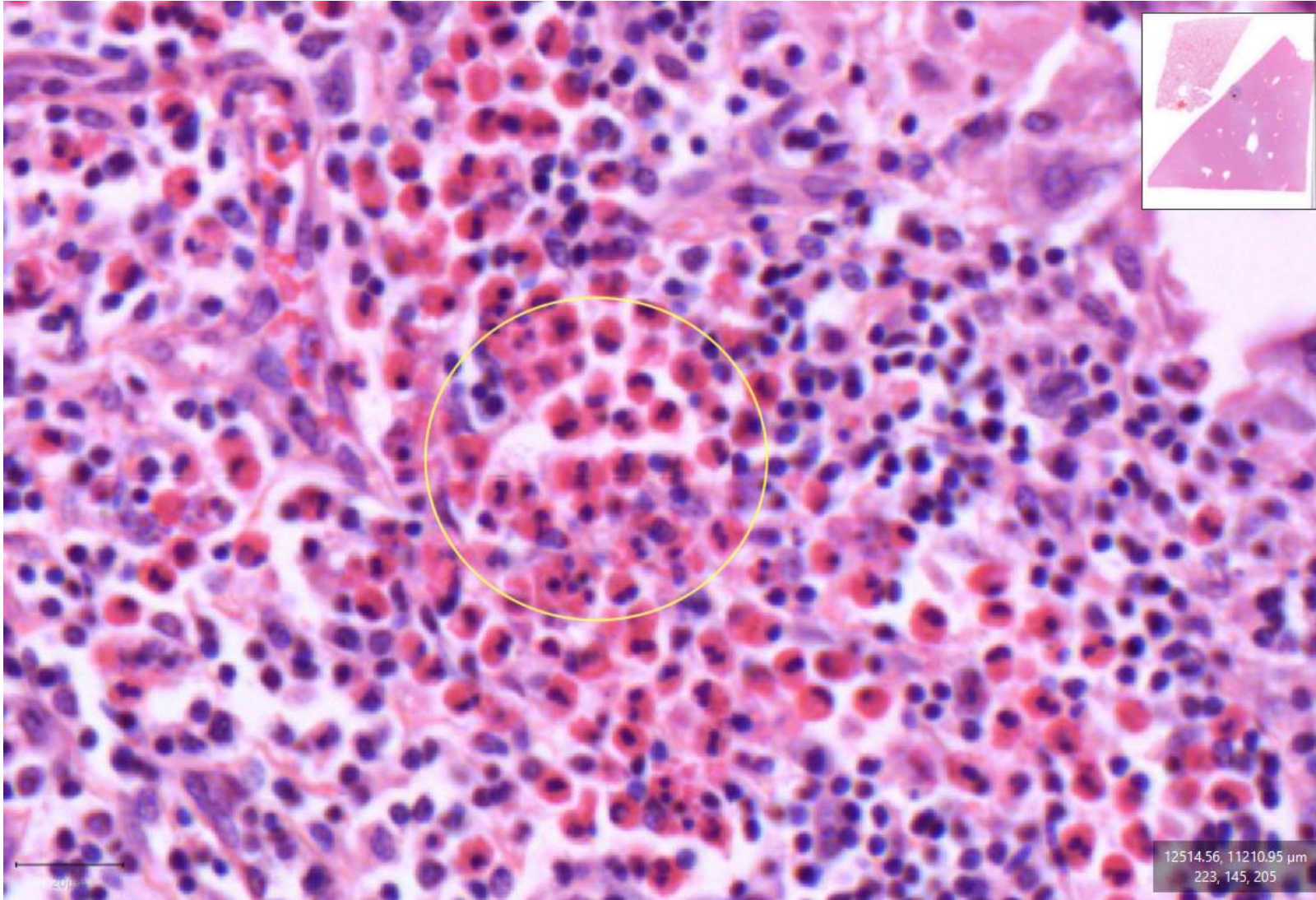


Q1. What is the structure highlighted in yellow? What does its presence suggest?

This is a lymphoid follicle, a structure formed when there is active lymphoid proliferation. The paler area in the middle is where you have the active proliferation occurring. This finding indicates strong antigenic stimulation of the adaptive immune system.



## Slide 4 – Focal eosinophilic hepatitis in a horse

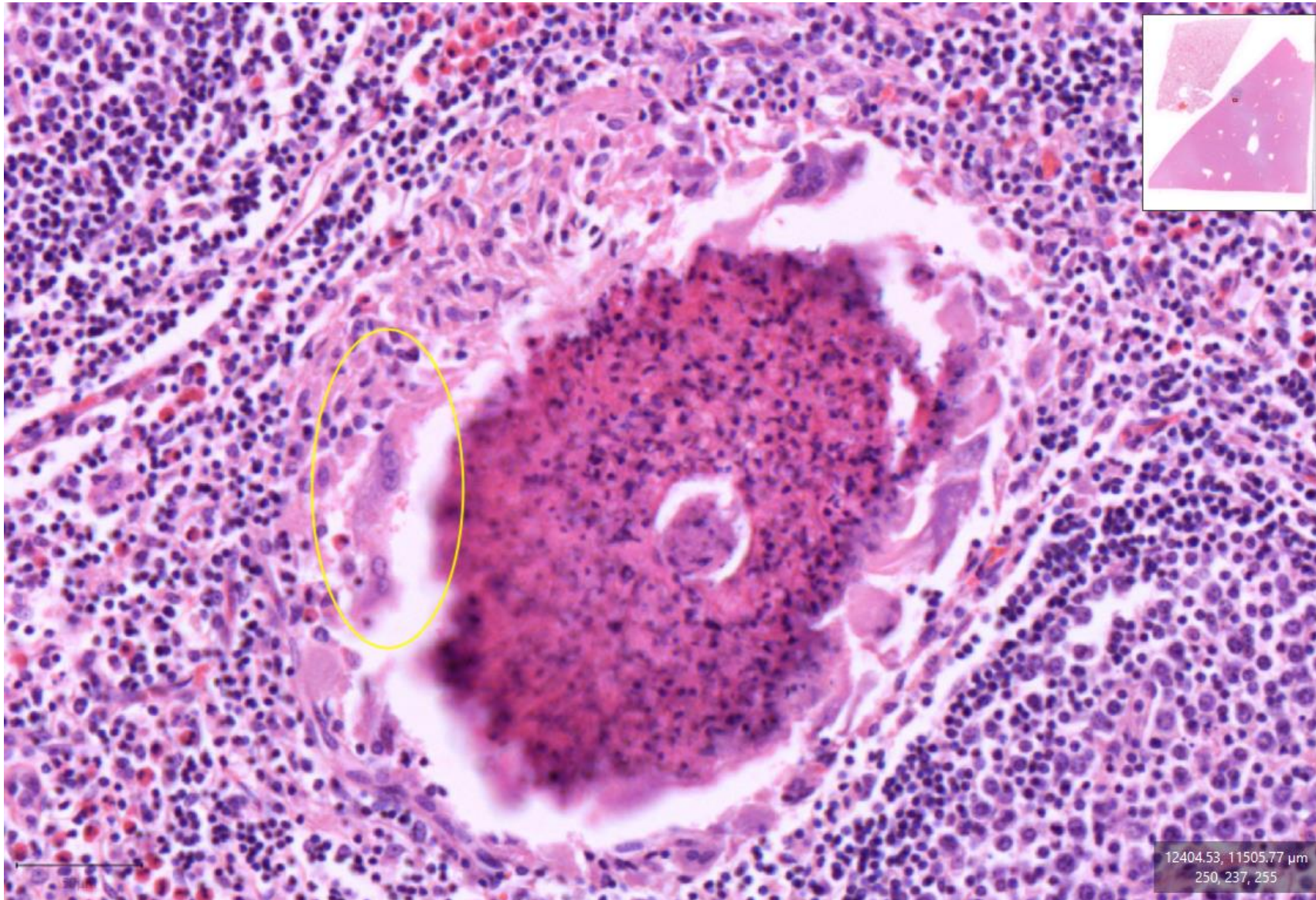


Q2. What type of cells are these?  
What do they suggest in inflammation?

These cells have red granules in their cytoplasm and a bilobed nucleus and therefore are eosinophils. Eosinophils are classically associated with parasitic diseases (as in this case) or allergic disease.



## Slide 4 – Focal eosinophilic hepatitis in a horse

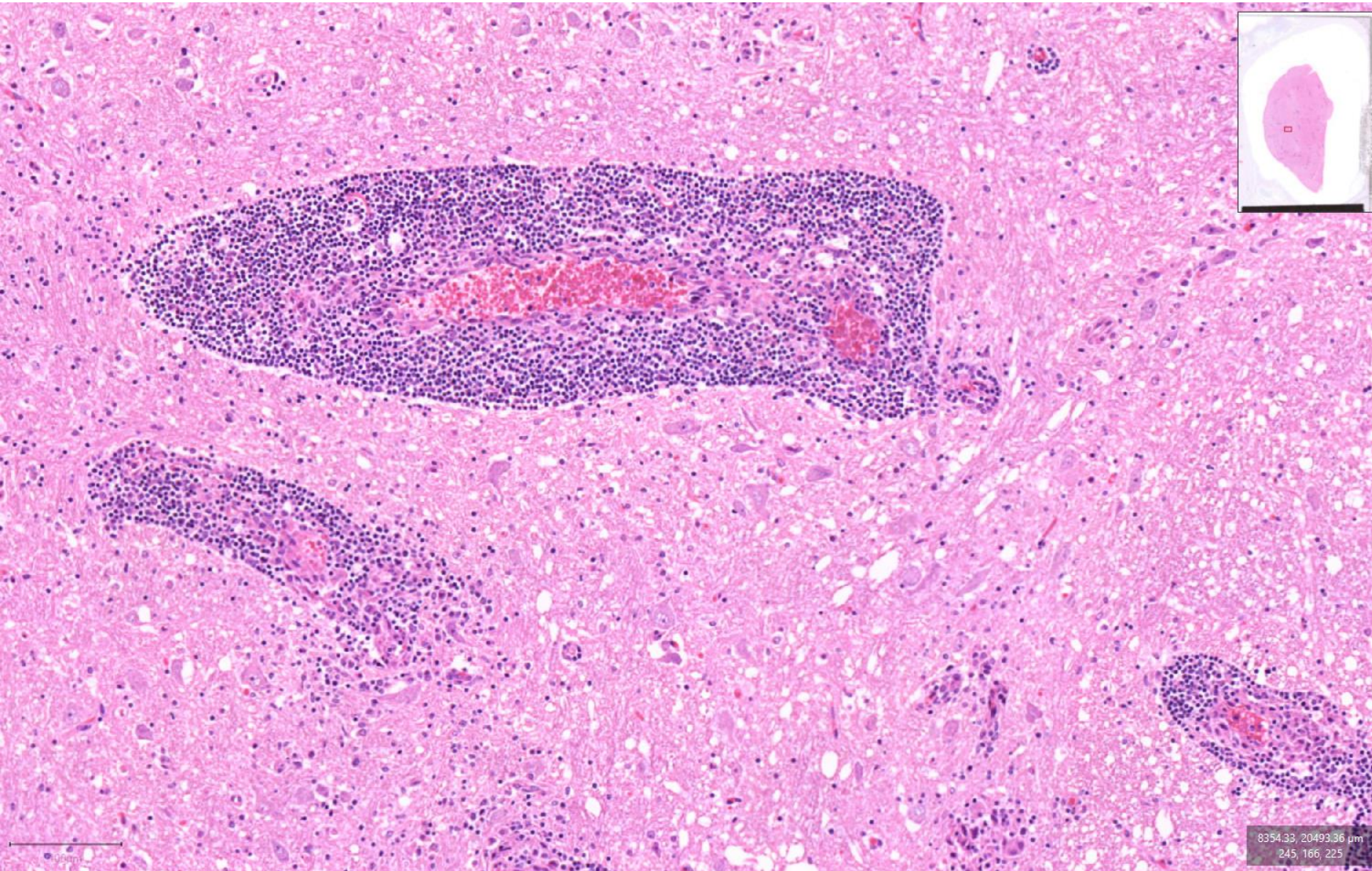


Q3. What are the cells highlighted in yellow around the edges of the parasite tract? Why are they there?

These are cells with multiple nuclei bunched up together, so they are giant cells. These are formed from fused macrophages, and often develop when individual macrophages cannot phagocytose an insult (such as a large parasite in this case). Remember that while we normally describe inflammation as one type or another, more commonly there is a mix of inflammatory cells present (in this case lymphocytes, eosinophils and macrophages).



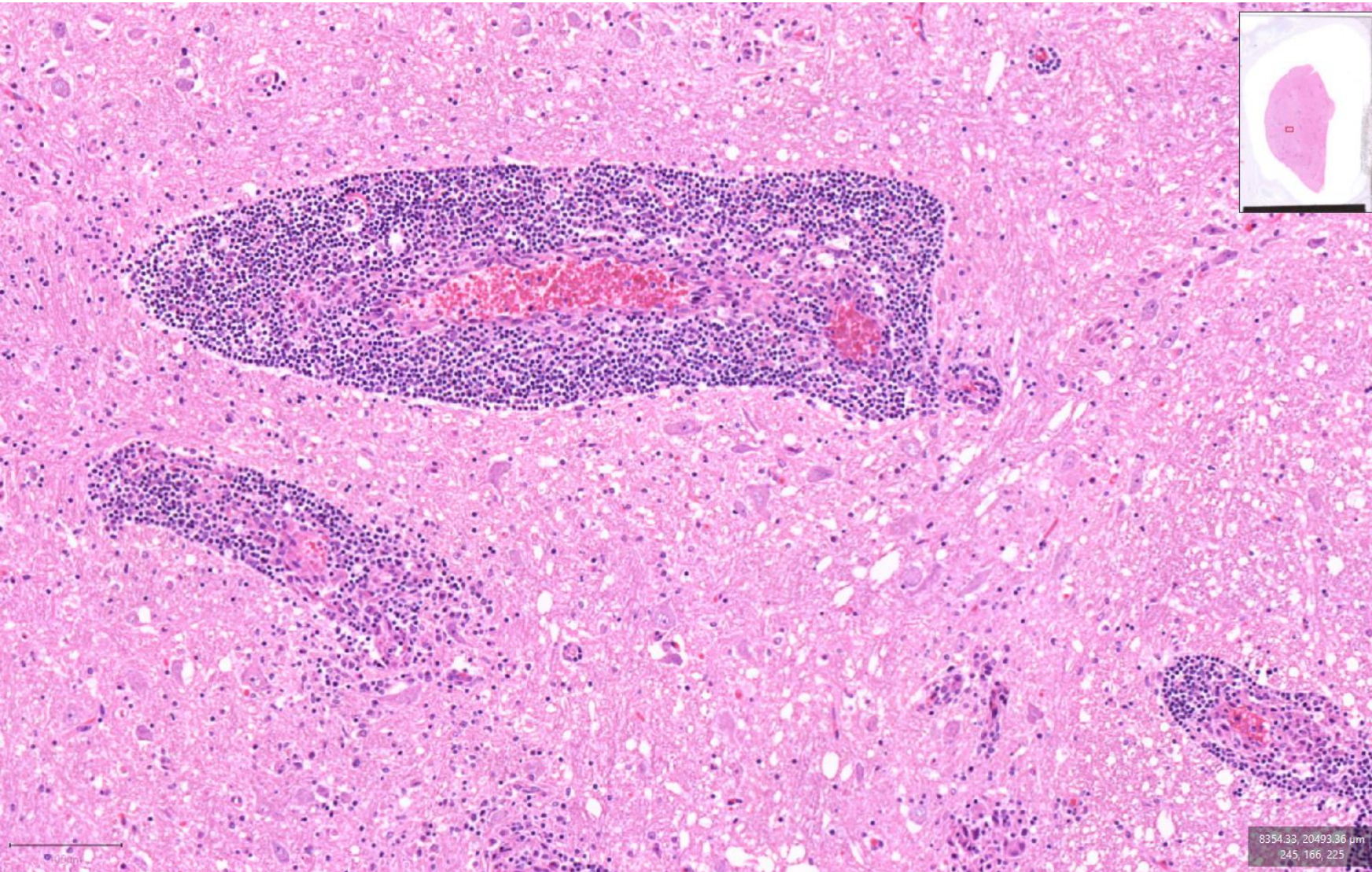
## Slide 5 – Lymphohistiocytic encephalitis



Q1. What causes would you consider for this type of inflammation?



## Slide 5 – Lymphohistiocytic encephalitis



Q1. What causes would you consider for this type of inflammation?

Lymphocytic inflammation would most commonly suggest viral disease or autoimmune disease (when the body attacks its own tissues), but remember that this is a very general rule.



## Slide 6 – Primary intention wound healing



How will the portion of the skin highlighted in yellow heal?

How will the portion of the skin highlighted in blue heal?



## Slide 6 – Primary intention wound healing



How will the portion of the skin highlighted in yellow heal?

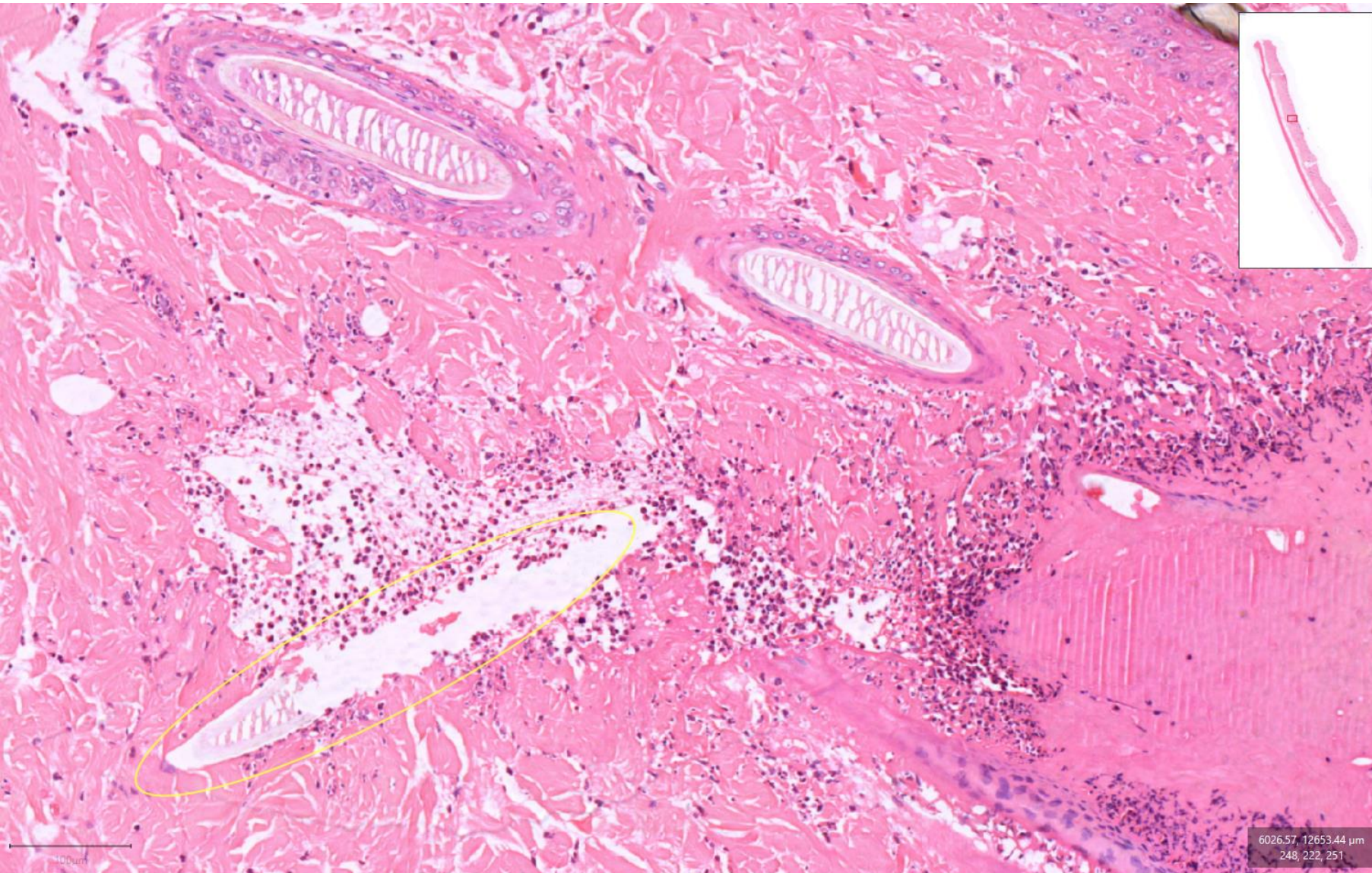
This is the epidermis, which is a labile tissue type. That means this tissue can undergo regeneration, with the epithelial cells proliferating and migrating across the surface.

How will the portion of the skin highlighted in blue heal?

This is a defect in the tissue, and so will heal by repair. It will fill with fibrin, and then granulation tissue and fibrosis will heal the defect.



## Slide 6 – Primary intention wound healing

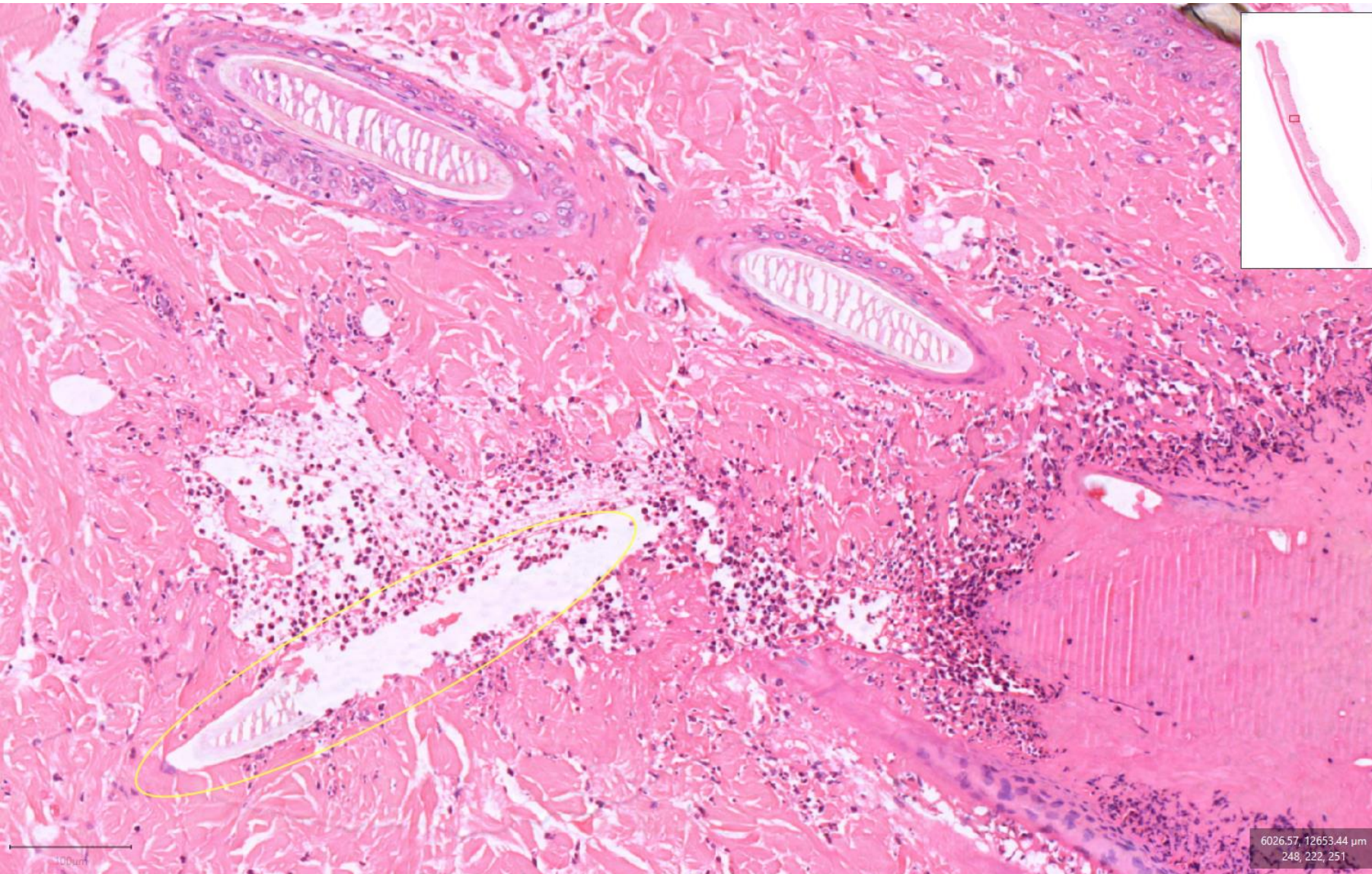


What is the object highlighted in yellow? Look at the rest of the image for clues.

How might this affect tissue healing?



## Slide 6 – Primary intention wound healing



What is the object highlighted in yellow? Look at the rest of the image for clues.

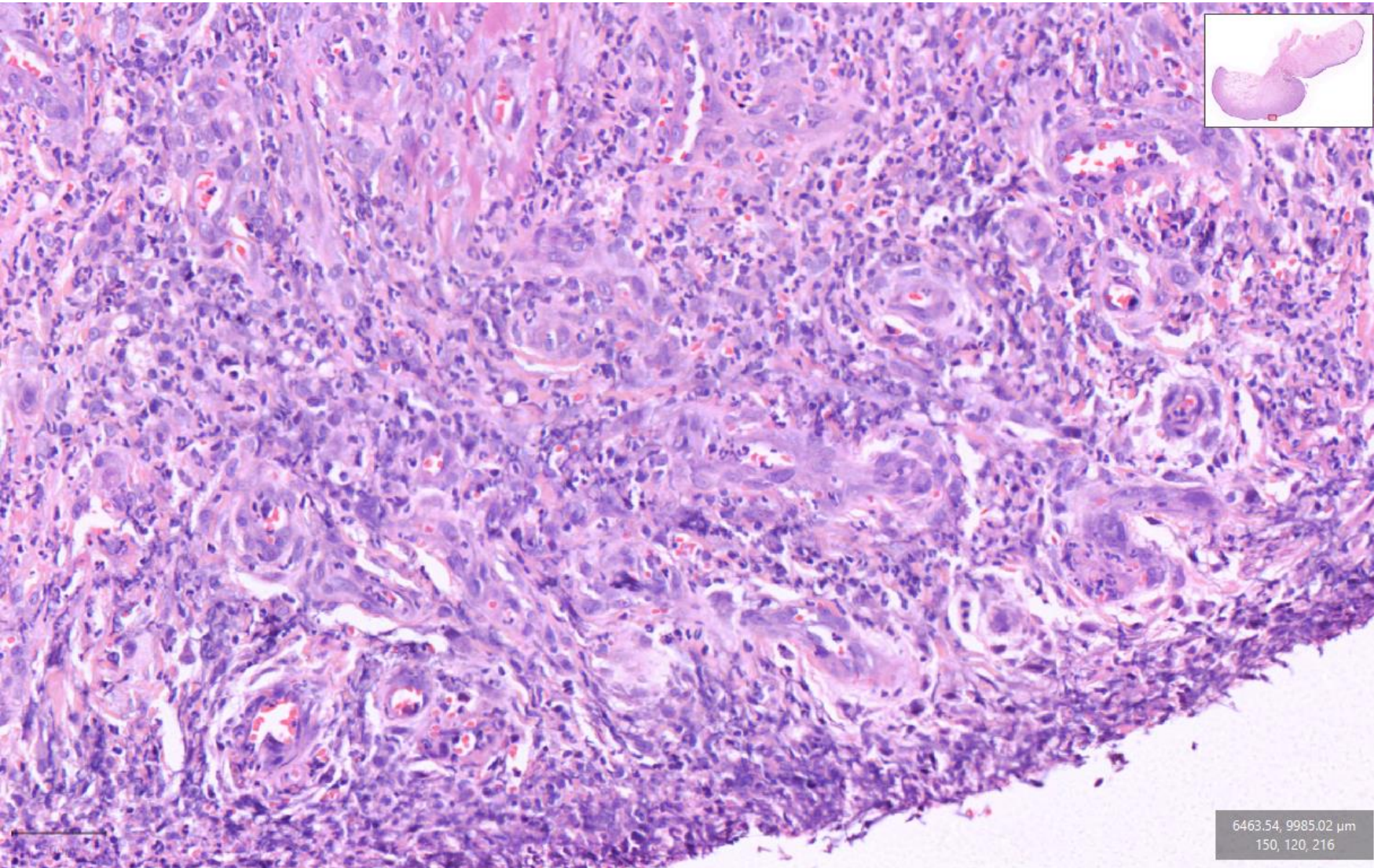
This is a shaft of hair that has become embedded in the wound.

How might this affect tissue healing?

This is a source of inflammation in the body (you can see the leukocytes gathering around it) and so healing will be delayed while this is still present.



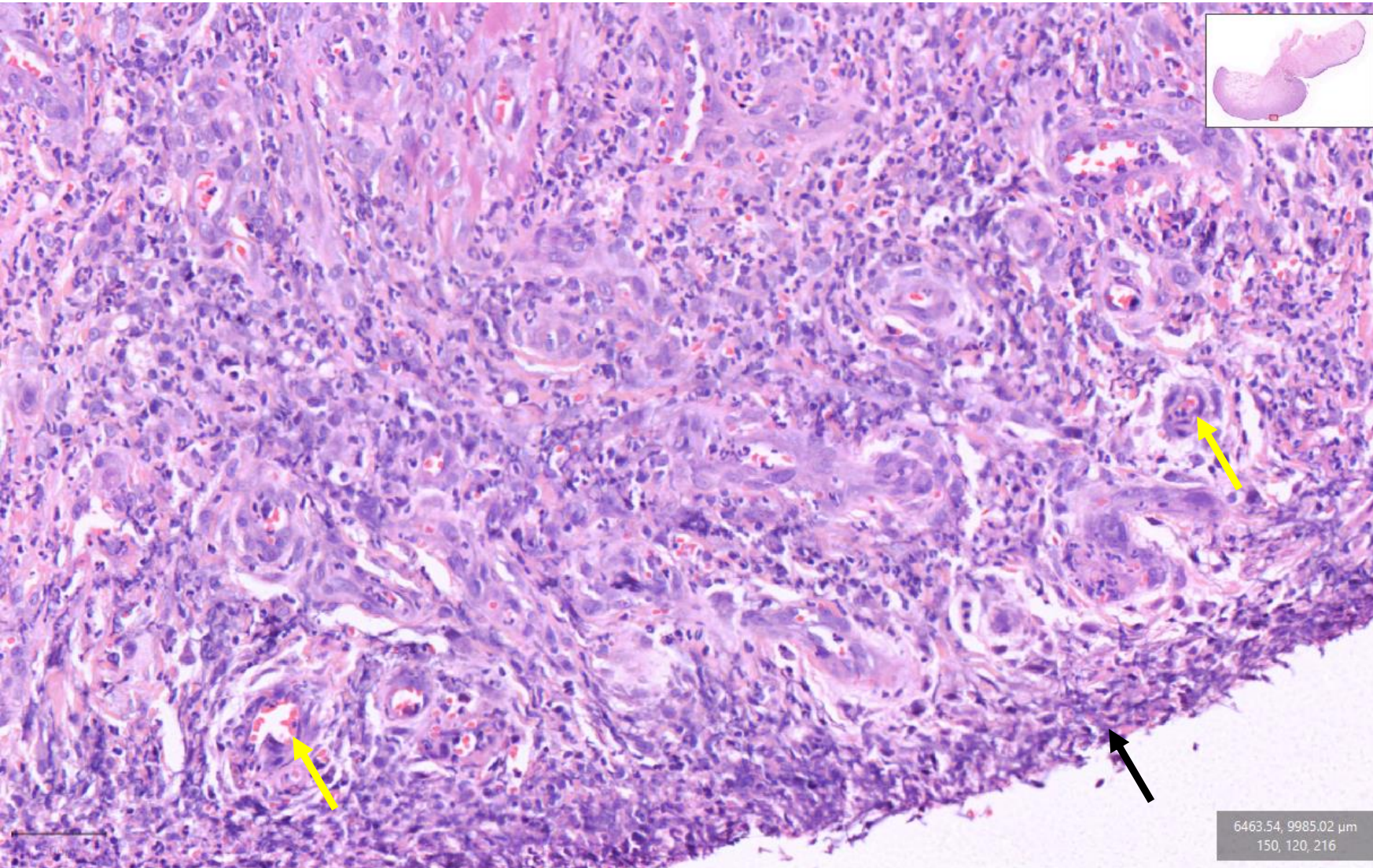
## Slide 7 – Ulcerated vaginal polyp in a dog



What cell types are present in the granulation tissue pictured here?



## Slide 7 – Ulcerated vaginal polyp in a dog

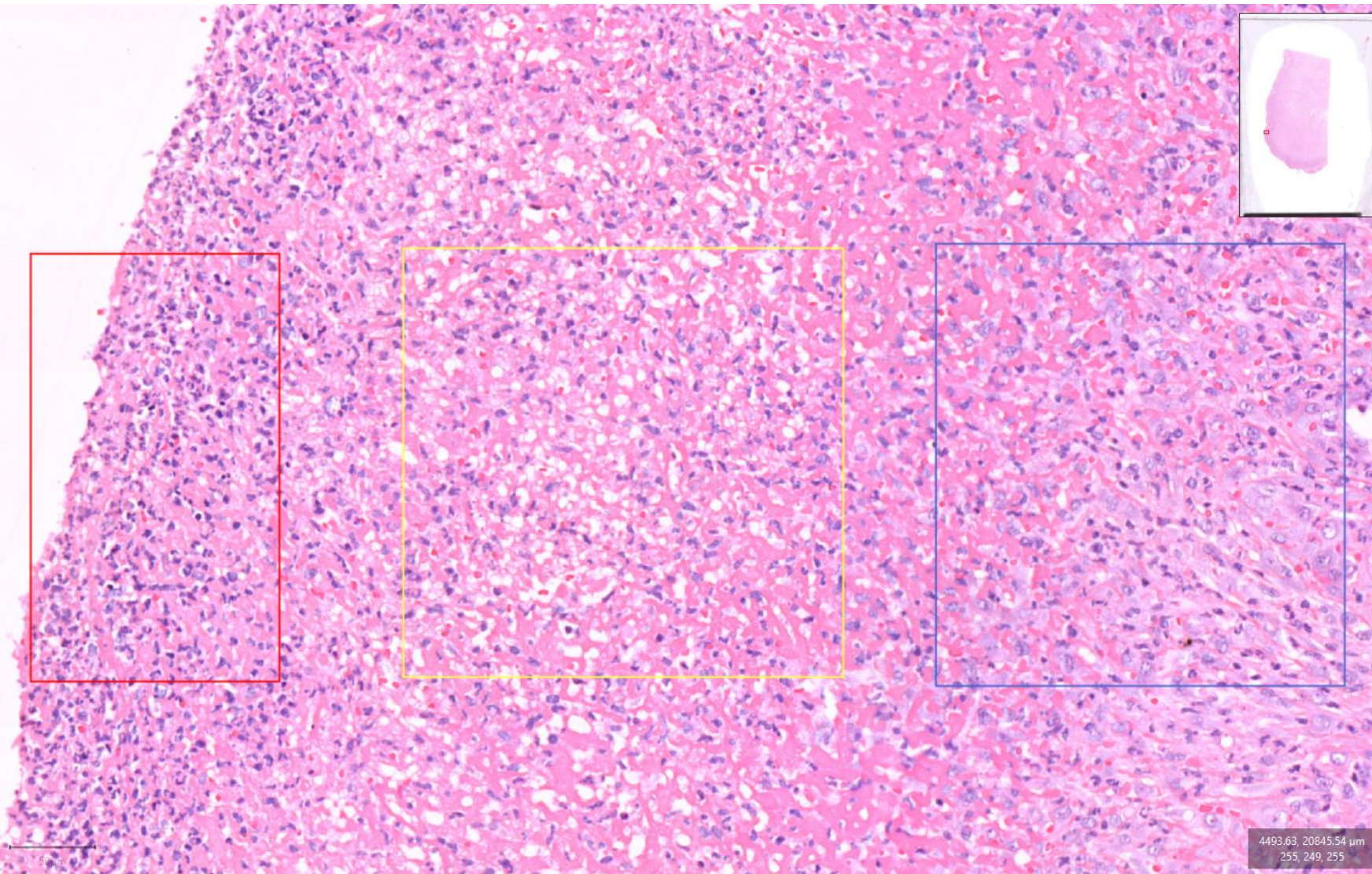


What cell types are present in the granulation tissue pictured here?

At the surface you have degenerate neutrophil fragments (black arrow) that are left after attempts to keep the surface clean. There are also neutrophils migrating towards the surface through the underlying tissue (the cells with the squiggly nuclei). Under the surface you have immature blood vessels (yellow arrows) and between them you have fibroblasts that will start to lay down collagen, though it can sometimes be difficult to tell them apart.



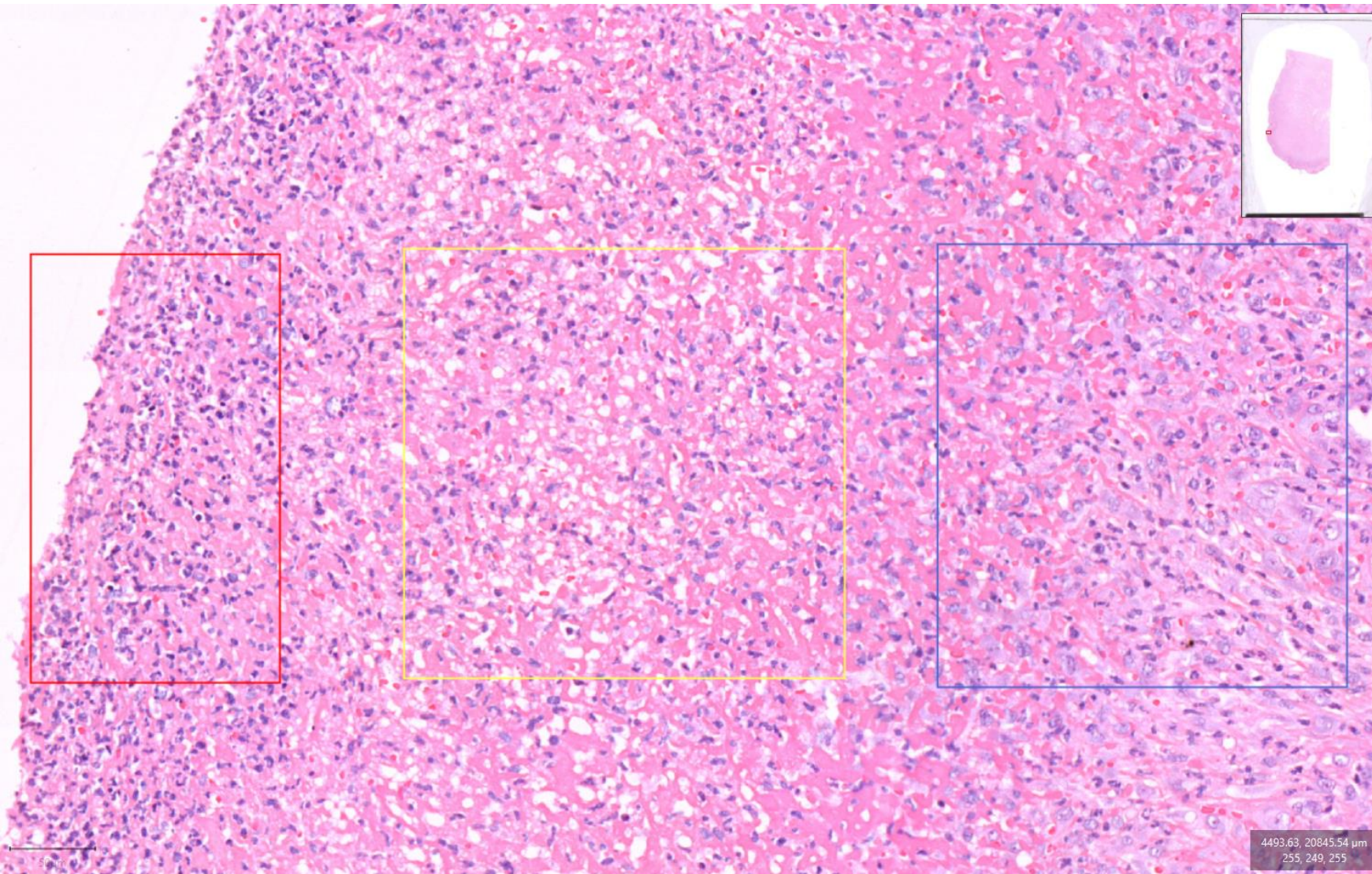
## Slide 8 – Granulation tissue



What processes of healing are occurring in each of the regions highlighted by the coloured boxes?



## Slide 8 – Granulation tissue



What processes of healing are occurring in each of the regions highlighted by the coloured boxes?

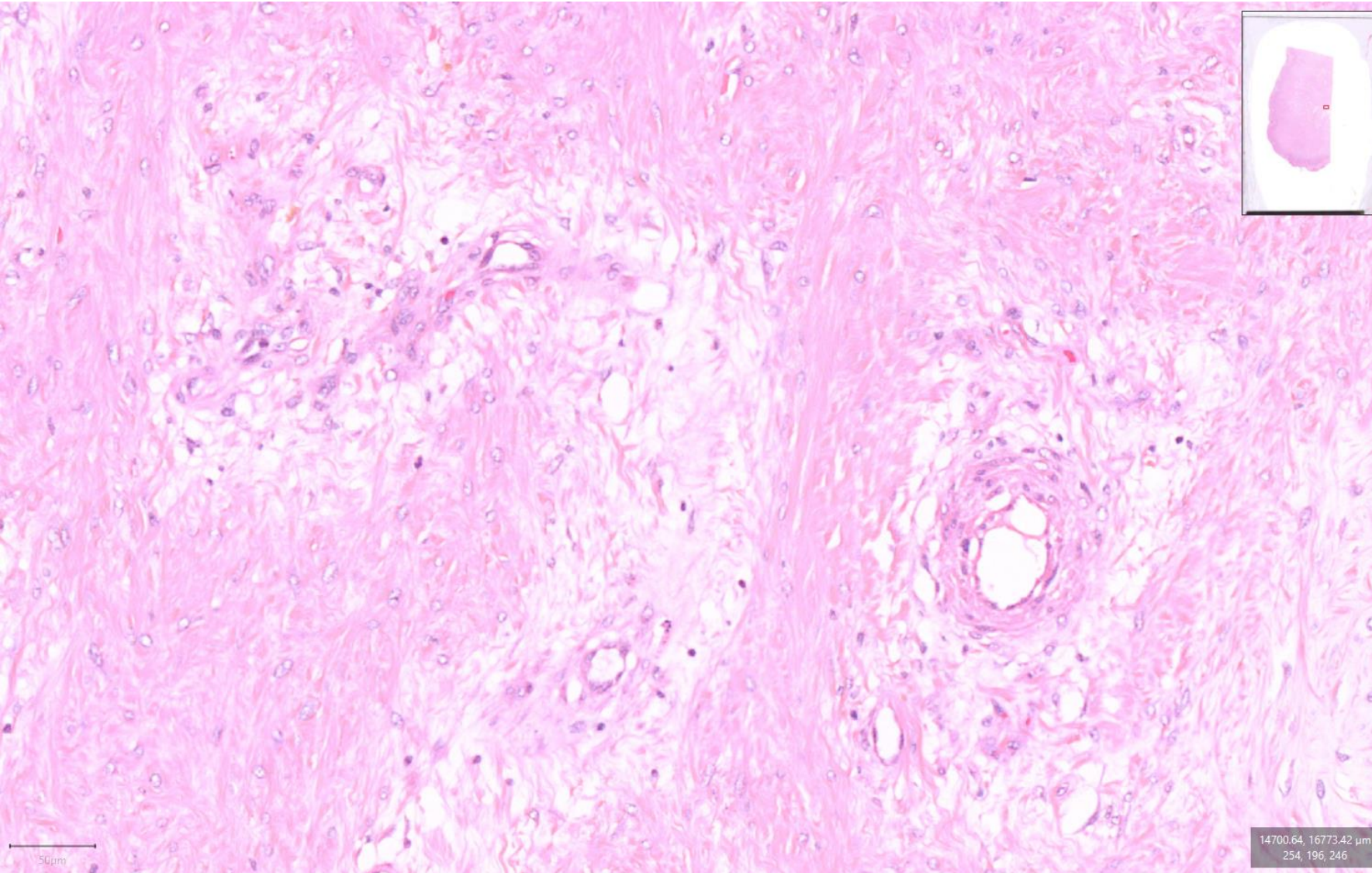
The red box is the fibrin deposit in active inflammatory phase, indicated by the large numbers of degenerate neutrophils fragments present (blue specks).

The yellow box is the more mature fibrin bed, ready for the development of granulation tissue

The blue box is the advancing proliferative phase, composed of blood vessels and fibroblasts, mixed with some migrating leukocytes



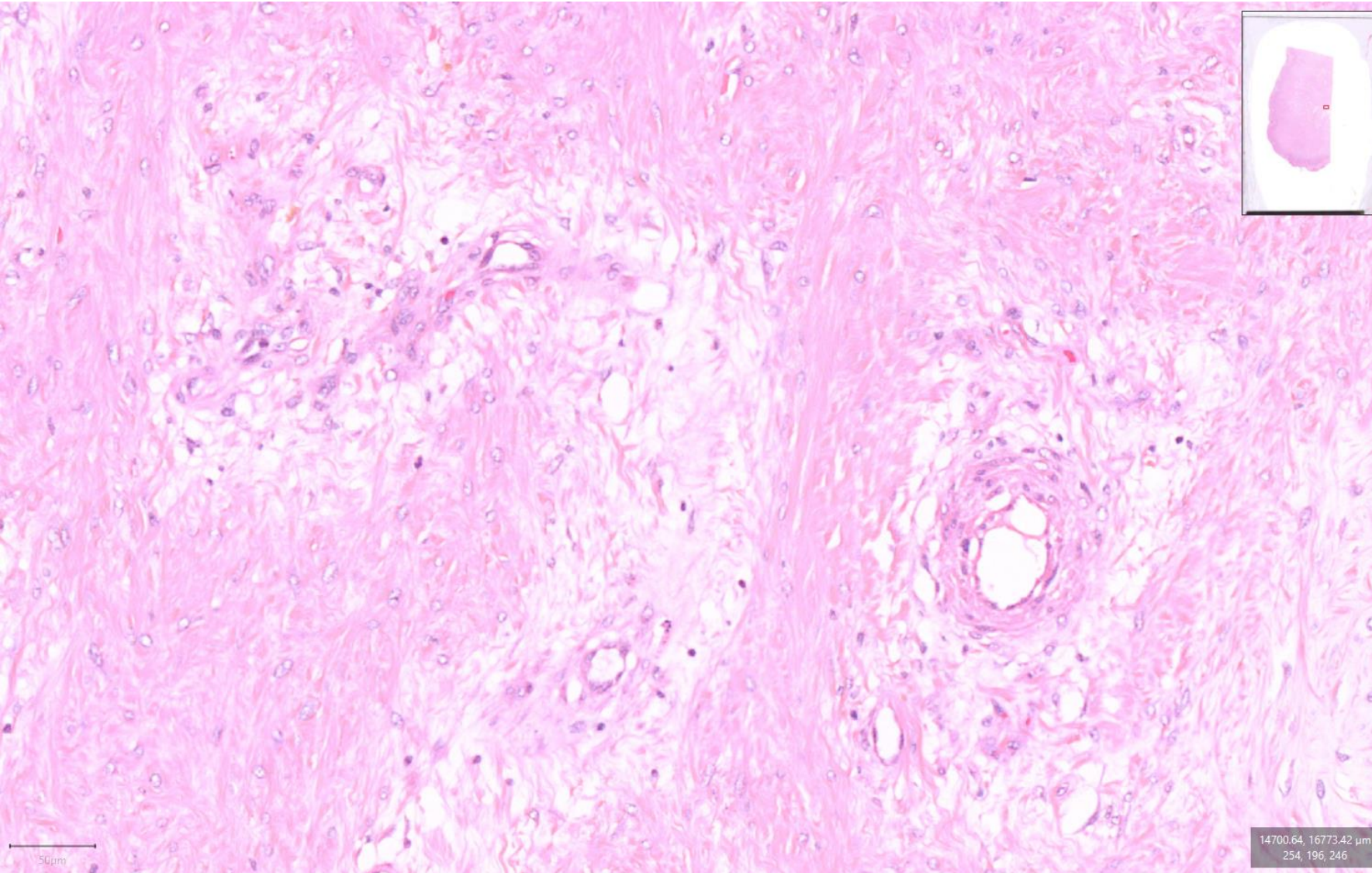
## Slide 8 – Granulation tissue



What are the blood vessels in this healing tissue surrounded by clear spaces?



## Slide 8 – Granulation tissue



What are the blood vessels in this healing tissue surrounded by clear spaces?

When new blood vessels initially form, they are quite leaky, and so the paler areas are areas of oedema due to fluid leaking out of the vessels. As the vessels mature, this will resolve.