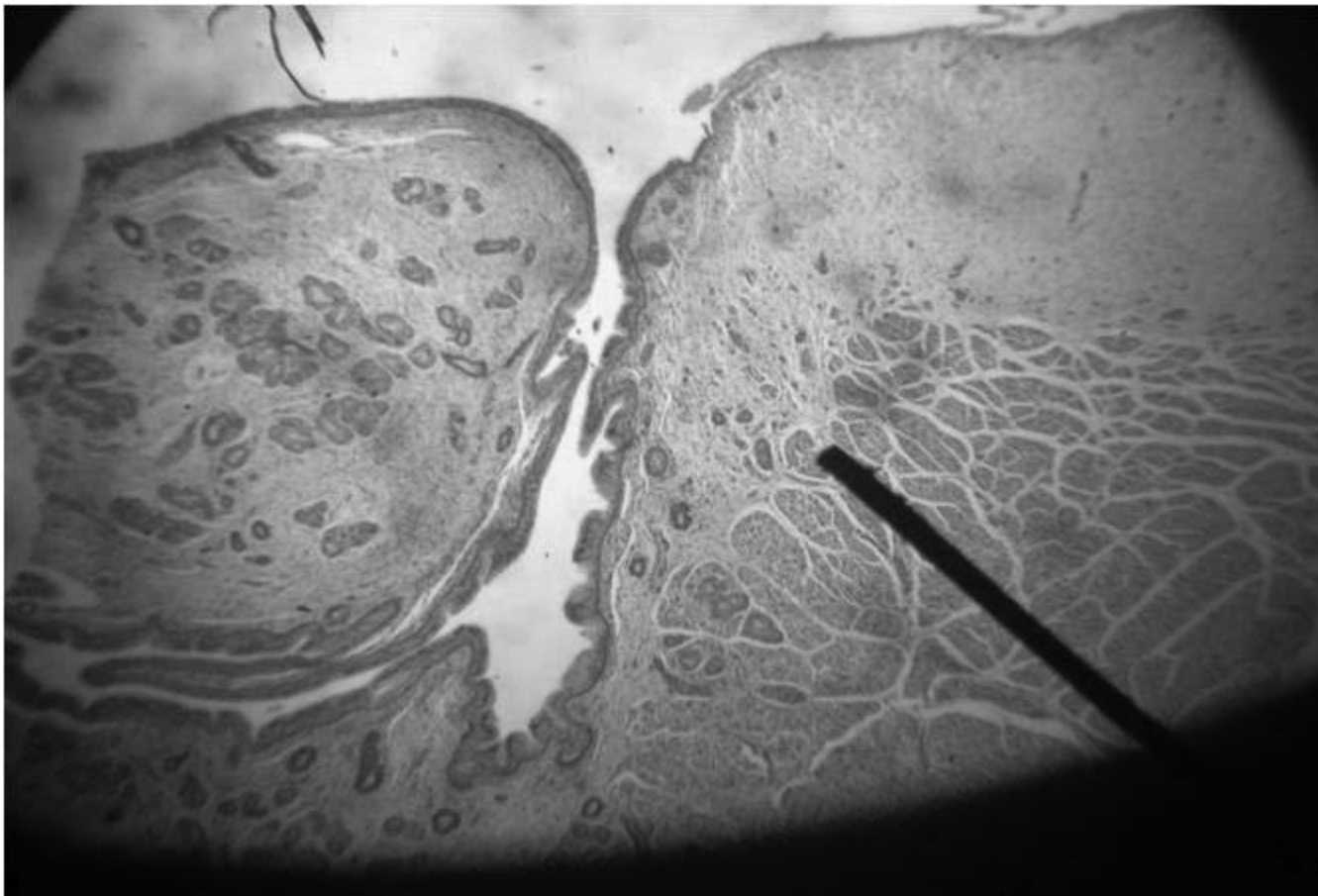




Histology Lab # 1

The conducting part of the respiratory system



كيف أعرف انه هذا سلايد للـ

larynx ? *the sinus or ventricle is a landmark of larynx

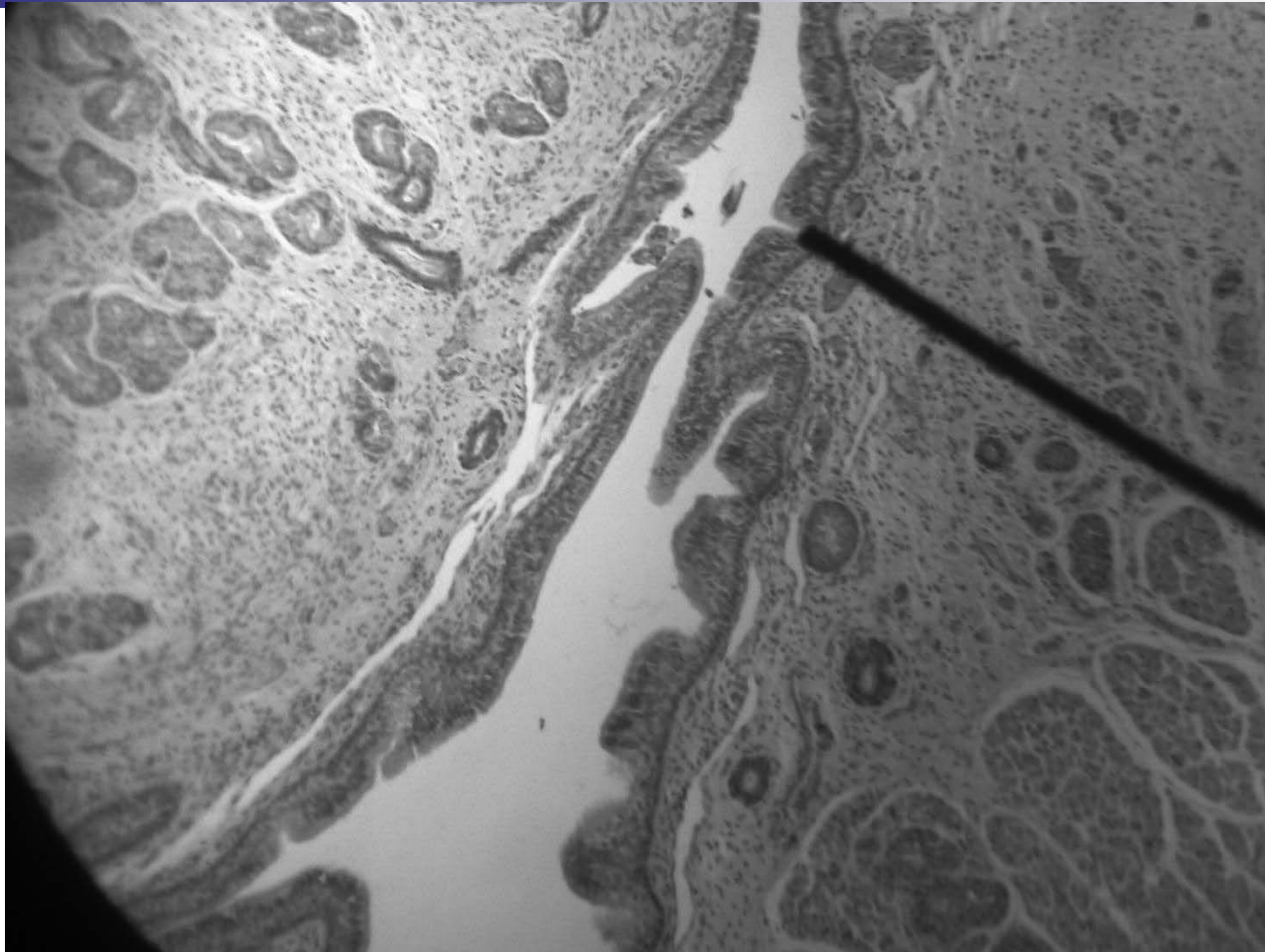
Ultimately , the section contains mucosa, sub mucosa, supporting tissue , and adventitia
the supportive layer composed of hyaline cartilage
the adventitia composed of connective tissue
the blood vessels found in submucosa



The larynx has three compartments; 1)the vestibule
2)the middle compartment that contains the ventricle which leads to a saccule.
3) And the infraglottic compartment.

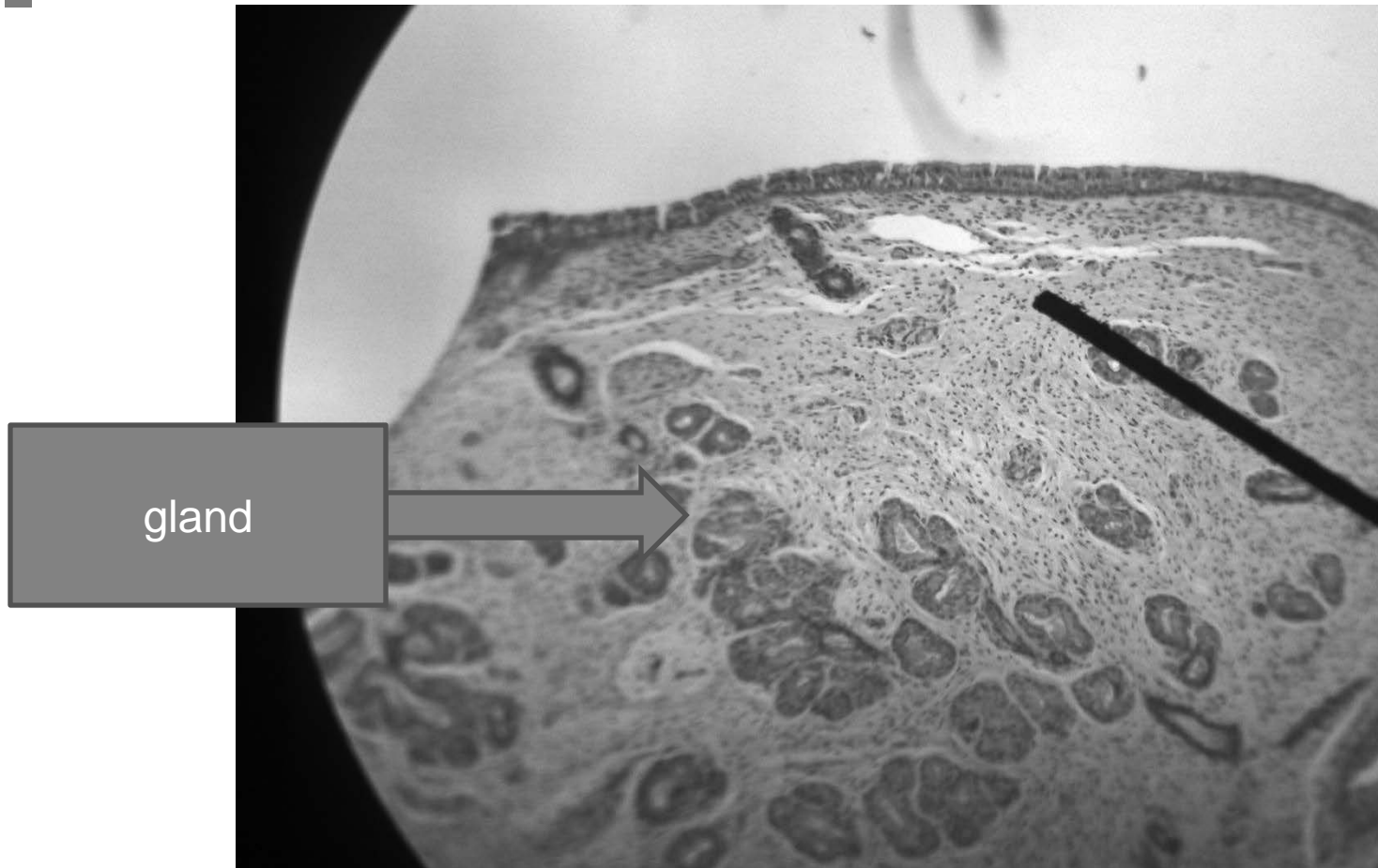
In this section we see the ventricle ,above we have the false vocal cords ,and below we've the true vocal cords. (above and below according to anatomy not to their position in the slide)

The lining epithelium of the ventricle is respiratory epithelium. The next layer is the lamina propria.



Notice the lining epithelium of the ventricle;
pseudostratified ciliated columnar epithelium with
goblet cell(respiratory).

The larynx--- The false vocal cord



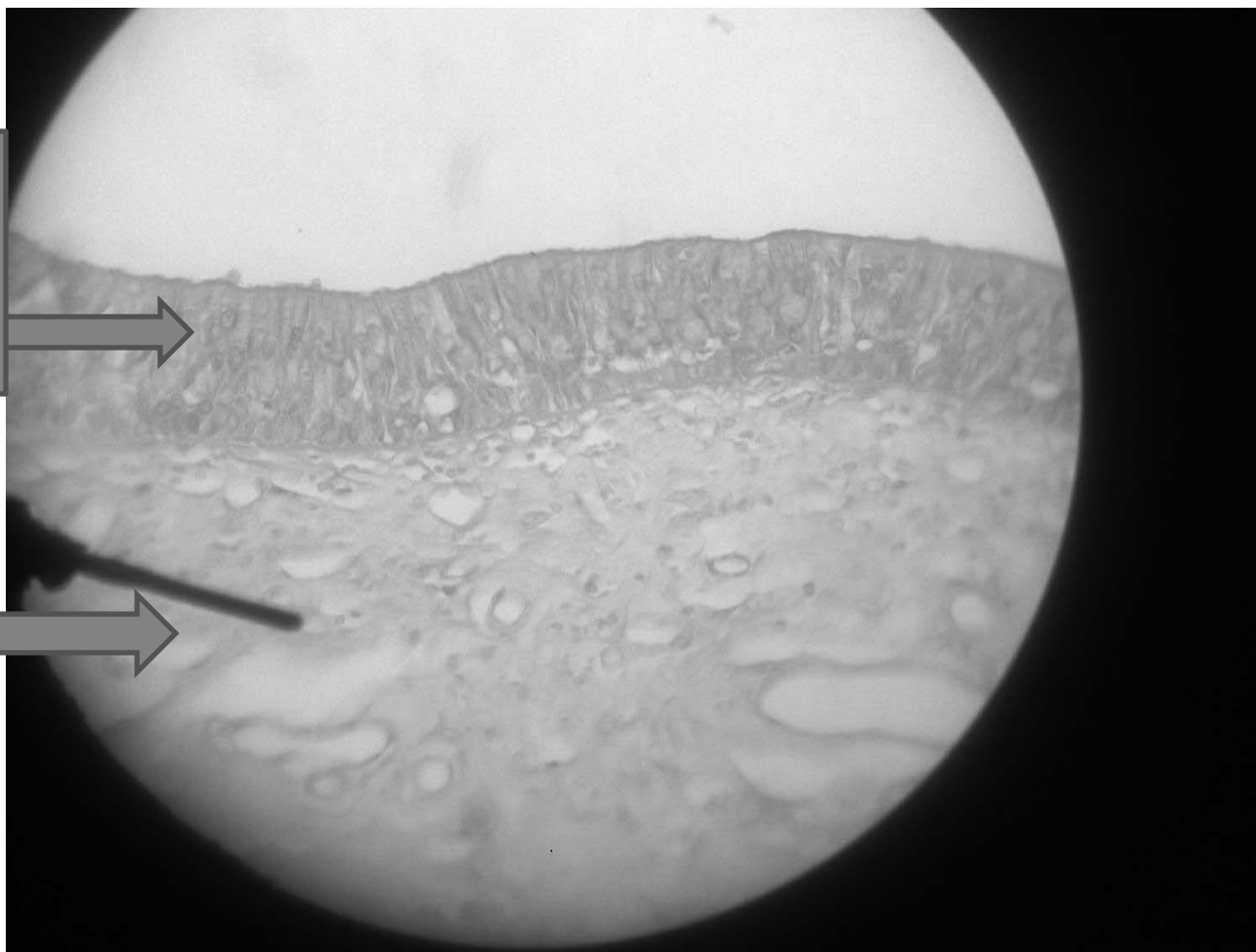
The lining epithelium is respiratory epithelium; pseudostratified (the nuclei at different levels ;however, all cell stems from basement membrane) ciliated columnar epithelium with goblet cells.

Characterized by the presence of the seromucous gland.

The gland found in the sacule till the false vocal cord ,its secretion goes to the true vocal cord for lubrication .

respiratory
epithelium
with goblet
cells

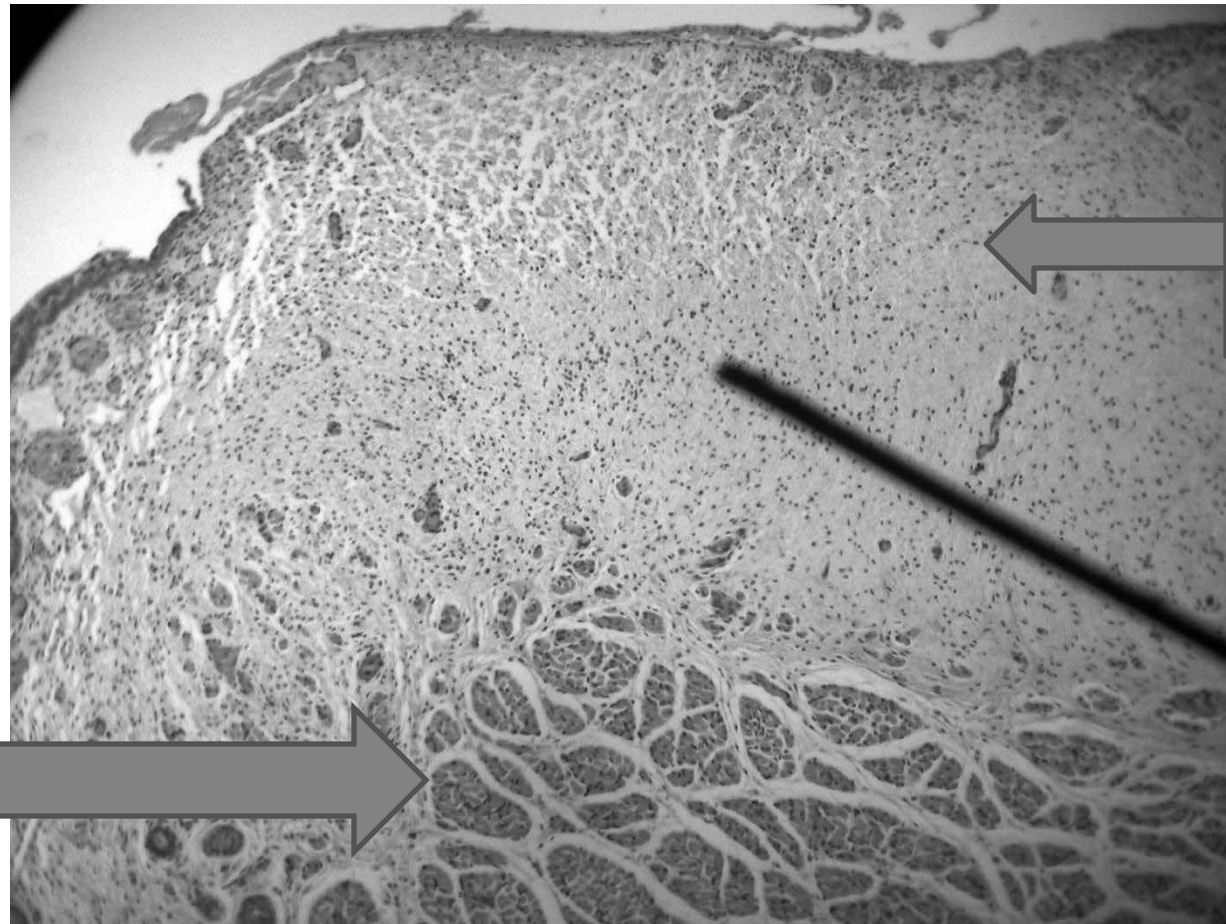
Blood
vessel



U can distinguish The false vocal cord by Its lining epithelium with the goblet cells.

In H&E goblet cells appear foamy with vacuoles

The true vocal cord



ligament

Vocalis
muscle

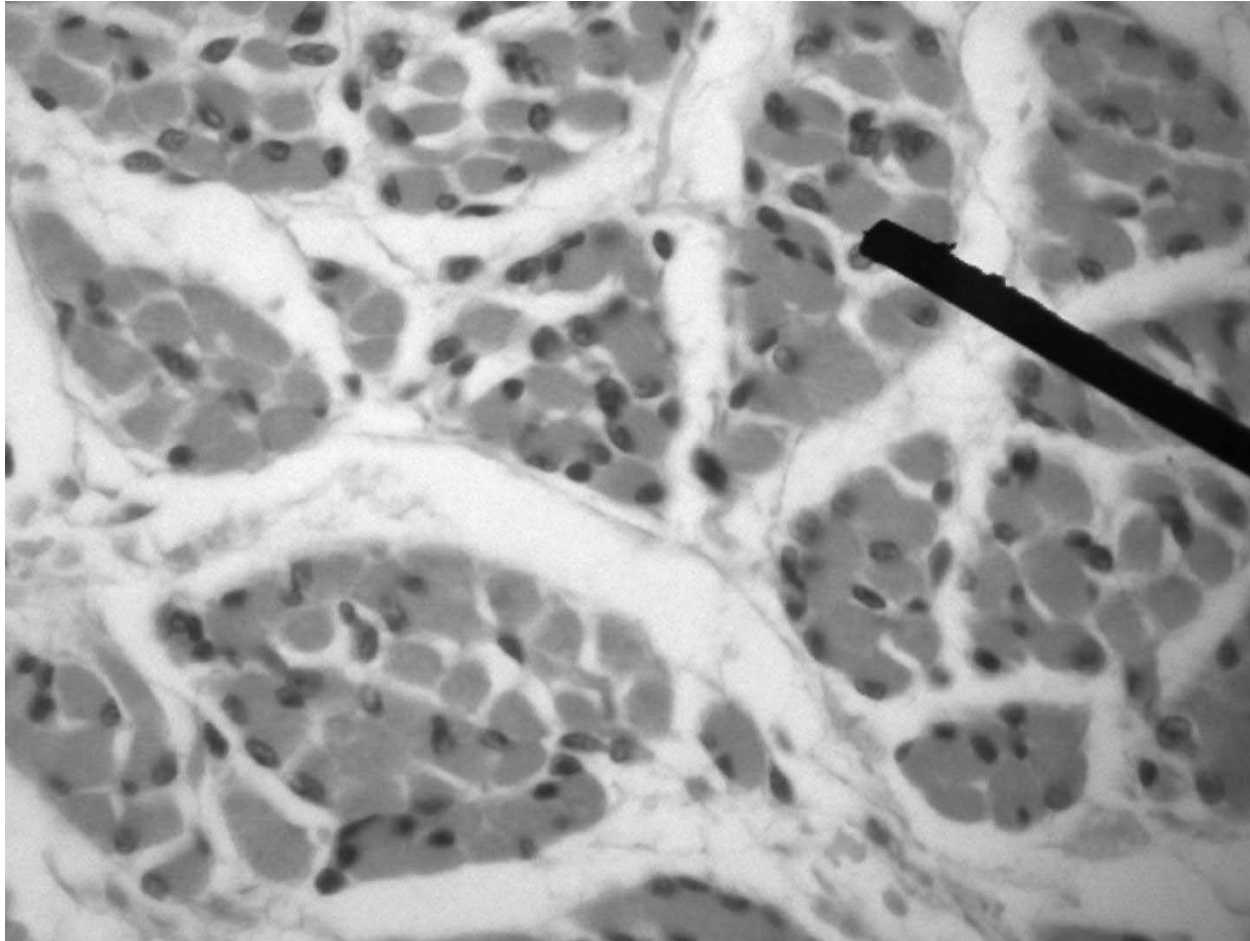
the true vocal cord has no glands :however, mucous reaches it from the false vocal cord for lubrication .

The lining epithelium is stratified squamous non-keratinized; to make the regeneration and mitosis very rapid in cases of injury.

No sub mucosa + no goblet cells

lower to true vocal cord , there're elastic tissue & collagen

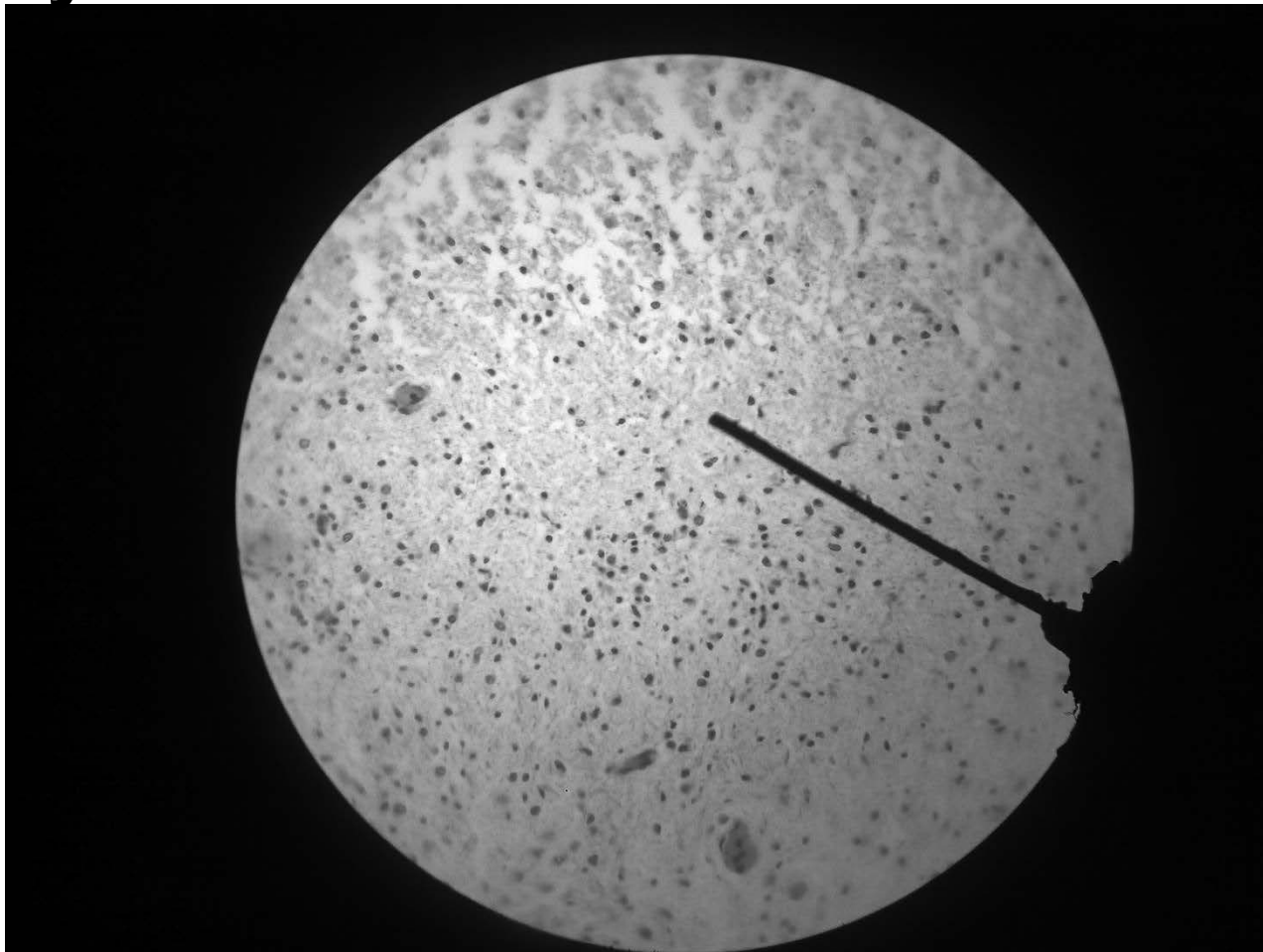
The larynx



The vocalis muscle ,which is a part of thyro-arytinoid muscle, relaxes the true vocal cord .

the nuclei are peripheral so it's Striated skeletal muscle .

The larynx

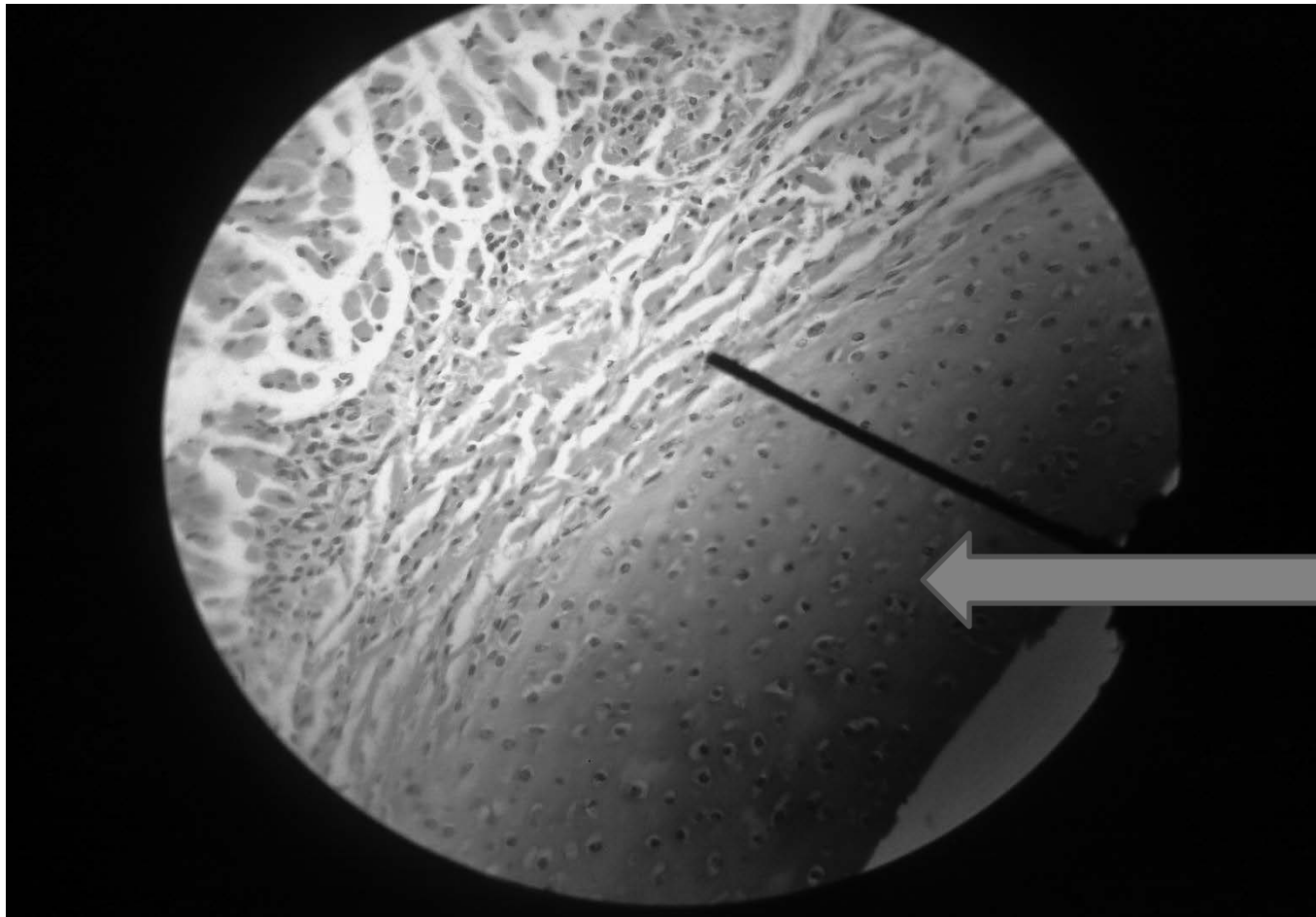


The ligament in the true vocal cord

Formed from the free edge of conus elasticus (cricothyroid membrane)

Contains elastic fibers which enable the cord to lengthen and shorten

The larynx



Hyaline cartilage

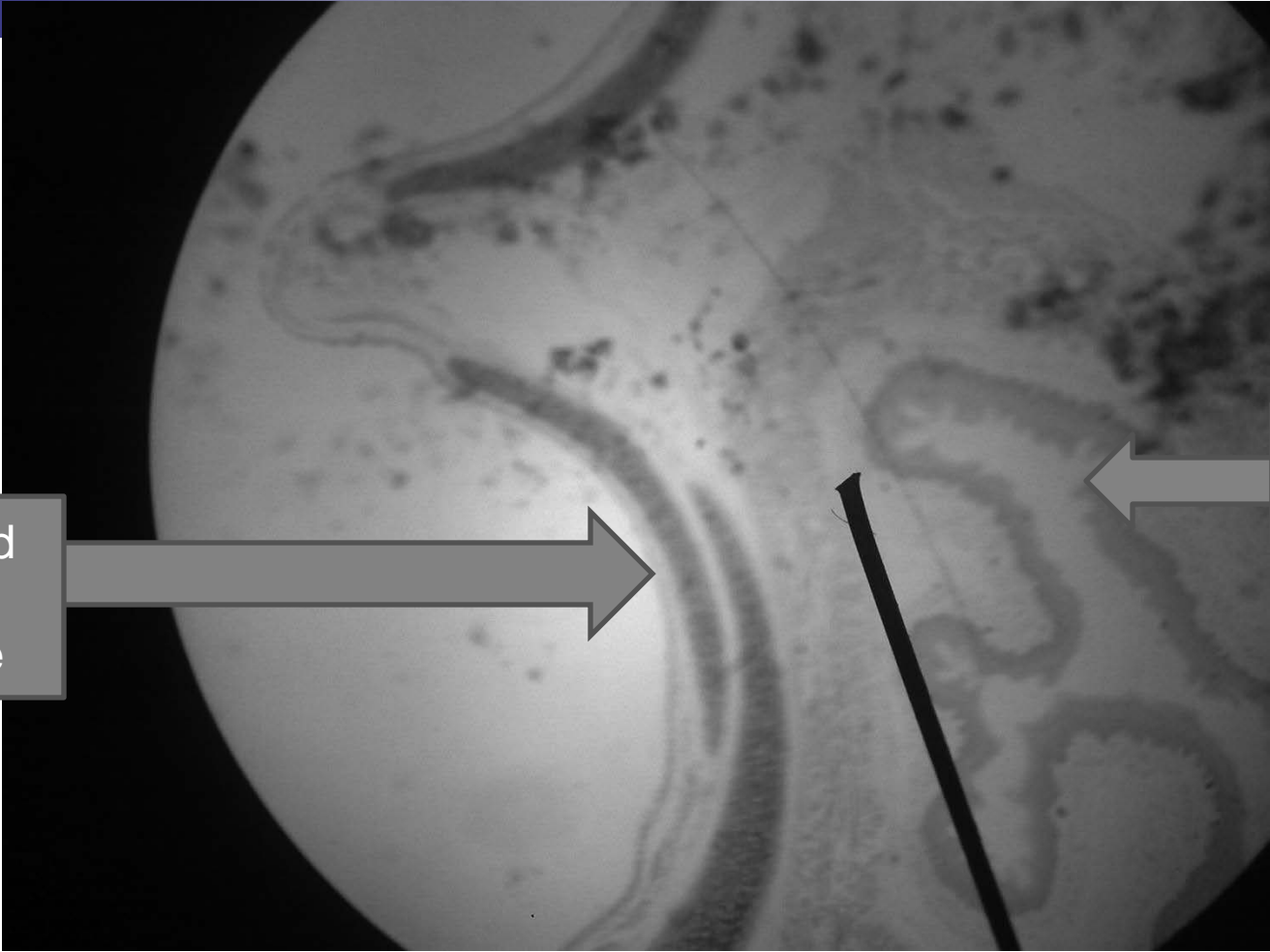
Notice the chondrocytes within lacunae

One or more chondrocytes in the form of nest.

**Once u see glands again that means u have moved into another region which is the infra-glottic region with respiratory epithelium (unavailable slide)



The trachea



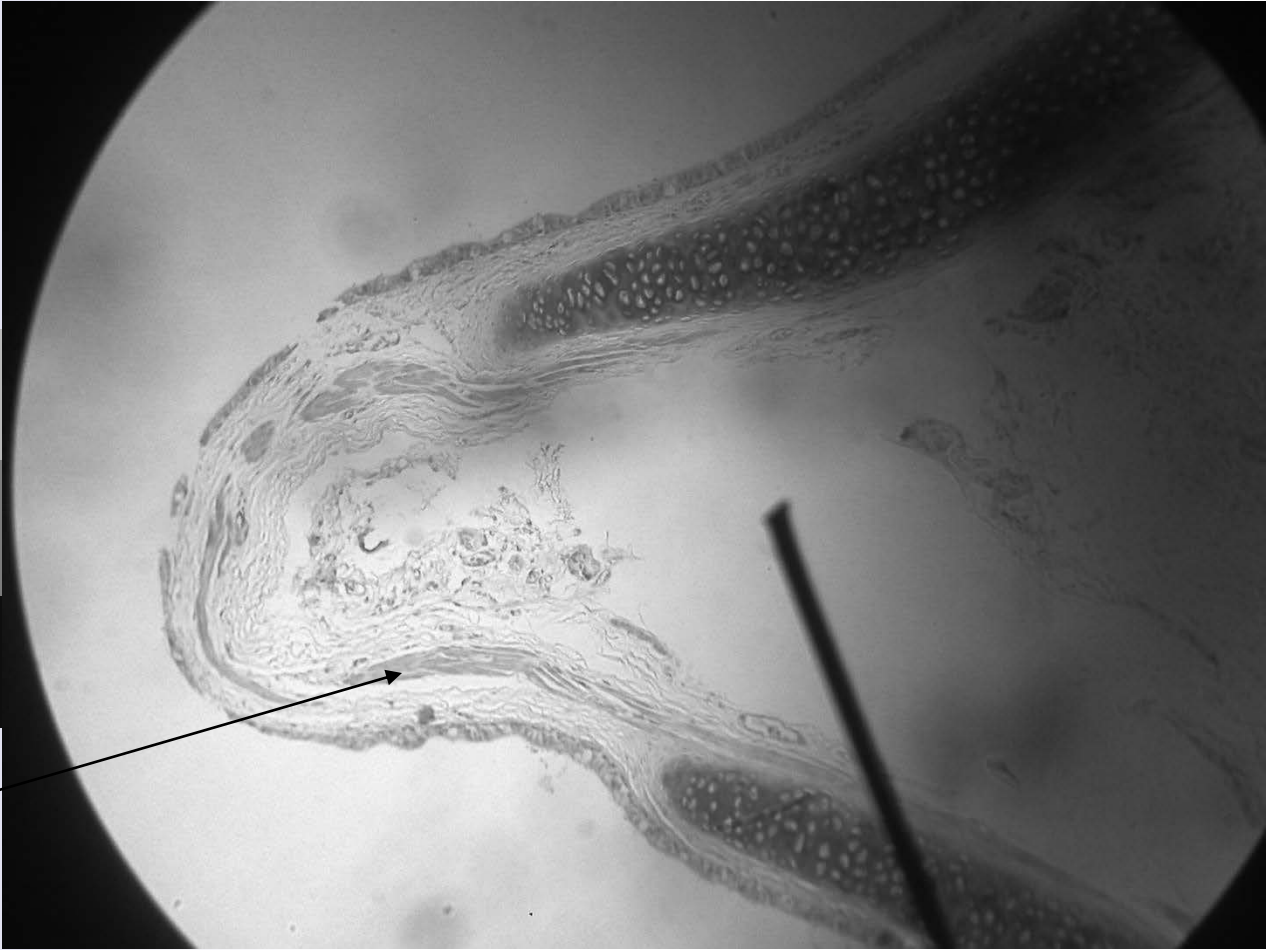
A black and white histological micrograph showing a cross-section of the trachea and esophagus. The trachea is on the left, characterized by a large, circular lumen lined by a thick, pink-stained wall of hyaline cartilage. The esophagus is on the right, showing a smaller, star-shaped lumen and a thinner wall. A black arrow points from the tracheal lumen towards the esophagus. Two grey arrows with text labels point to specific features: one points to the cartilage of the trachea, and the other points to the esophagus.

C shaped
hyaline
cartilage

esophagus

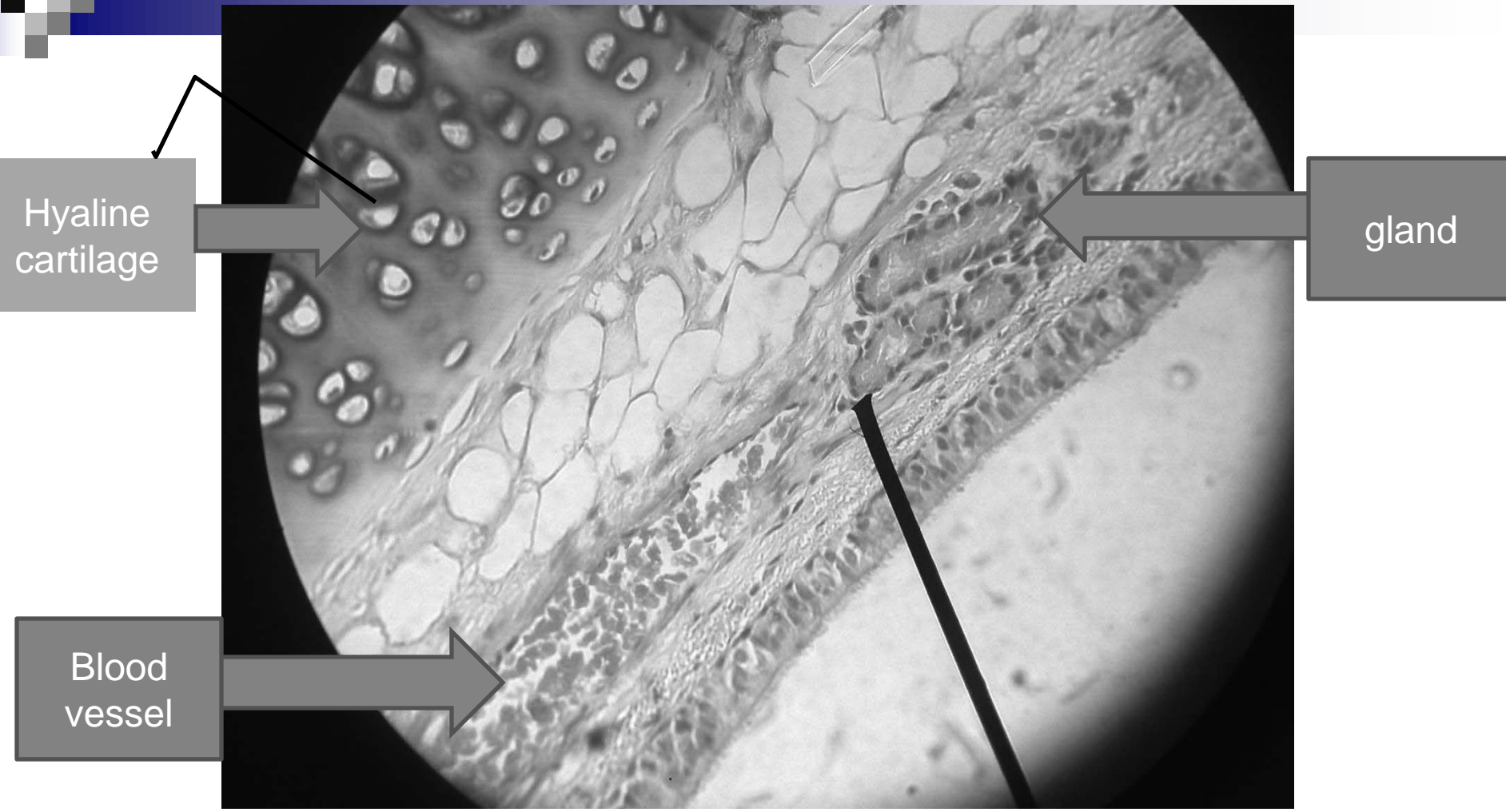
The trachea

Notice the esophagus posterior to the trachea
Star shaped lumen of the esophagus



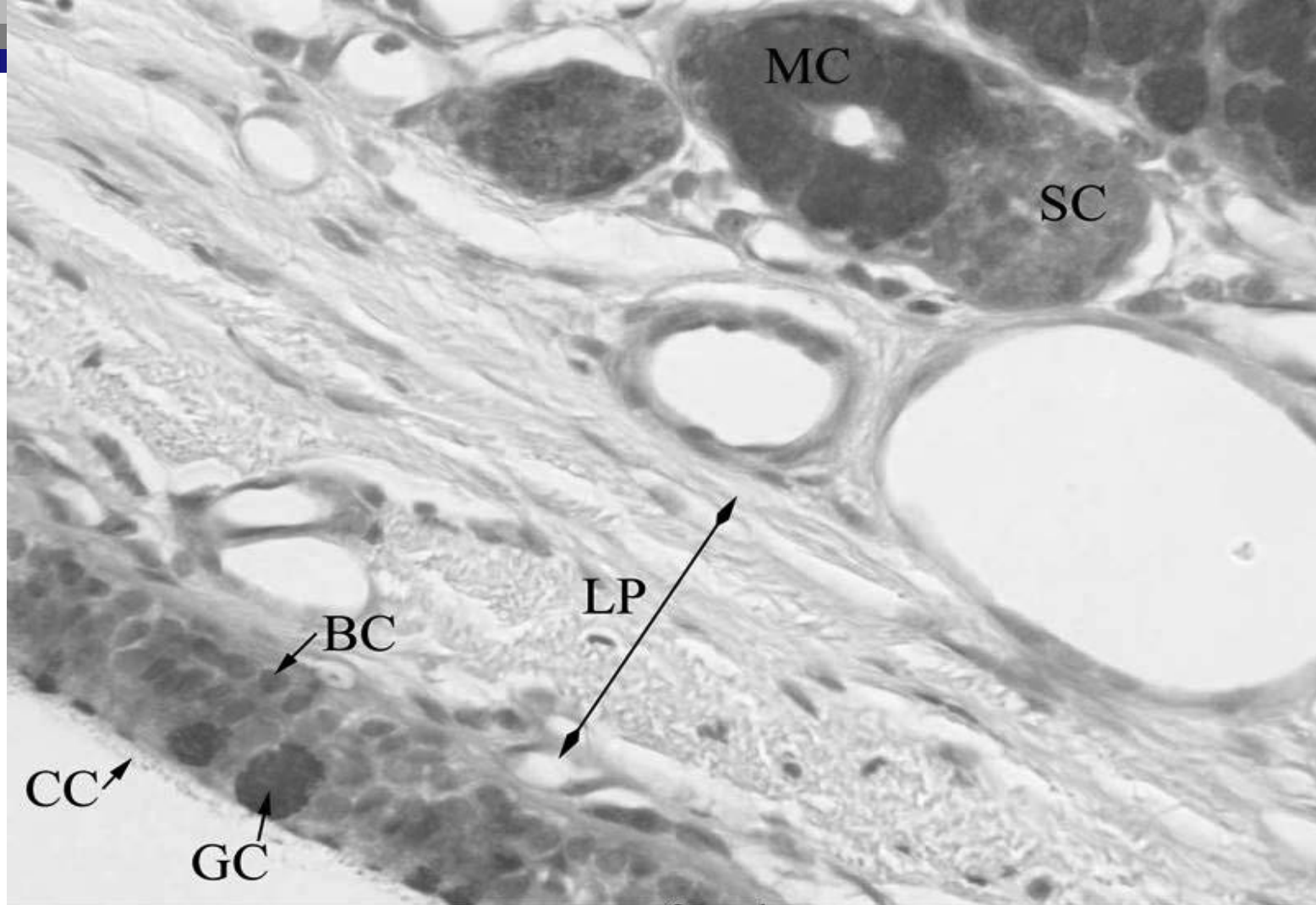
Trachealis
muscle

The posterior part of trachea, the trachealis muscle replaces cartilage to facilitate passage of bolus in oesophagus , note the end of the c-shaped cartilage



The gland in the trachea


Notice
the epithelium which is respiratory epithelium (pseudostratified ciliated columnar epithelium with goblet cells), the submucosa and the hyaline cartilage.
The cilia of the pseudostratified columnar epithelium.
The blood vessels in the submucosa.



mucosa of trachea

CC - pseudostratified epithelium with ciliated cells GC - goblet cells
BC - basal cells LP - lamina propria MC - mucous cells SC - serous cells

In PAS stain ,which is special,the glands appear dark violate

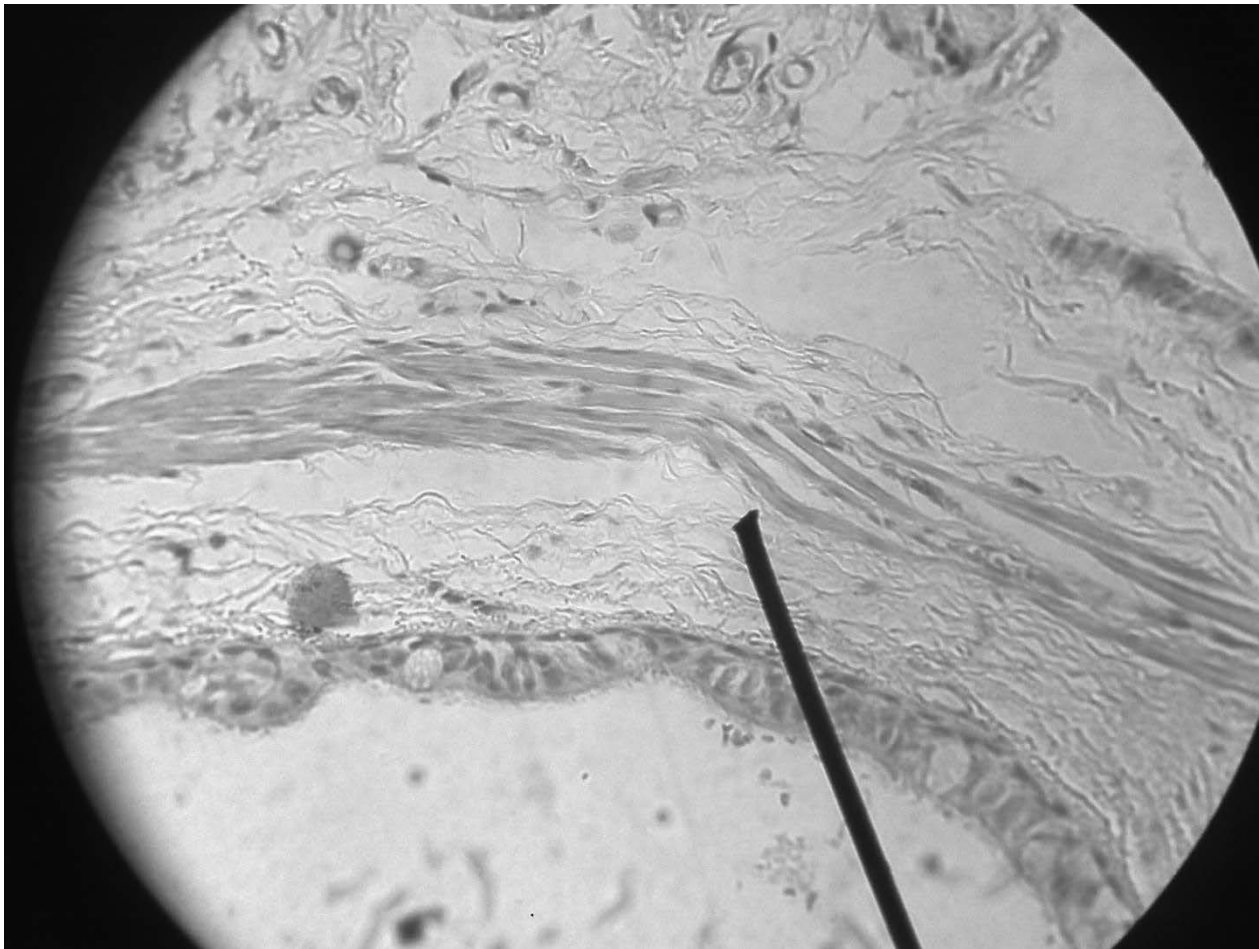


Be careful the section in the trachea might not show the gland , and if u asked whether there're glands or not , answer depending on the section u have at that moment (be honest).

Flashback >>>Mucosa consists of 3 layers epithelial , lamina propria , smooth muscle layer which is ill defined in respiratory tract in contrast to GIT

The serous demilune

Capping over the mucous part
Its duct opens on the surface .



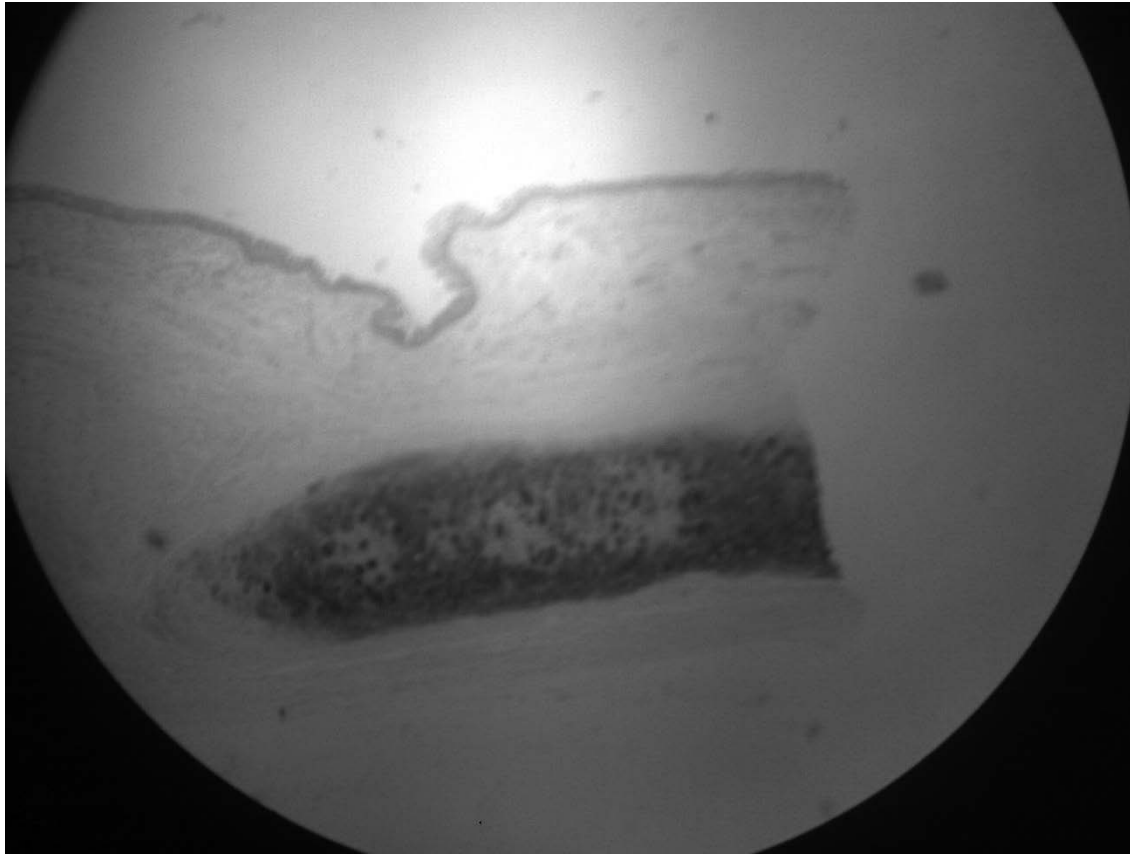
The trachialis muscle

Smooth muscle, the muscle cells are fusiform (spindle in shape) , the nuclei are elongated and in the middle.



The primary bronchus

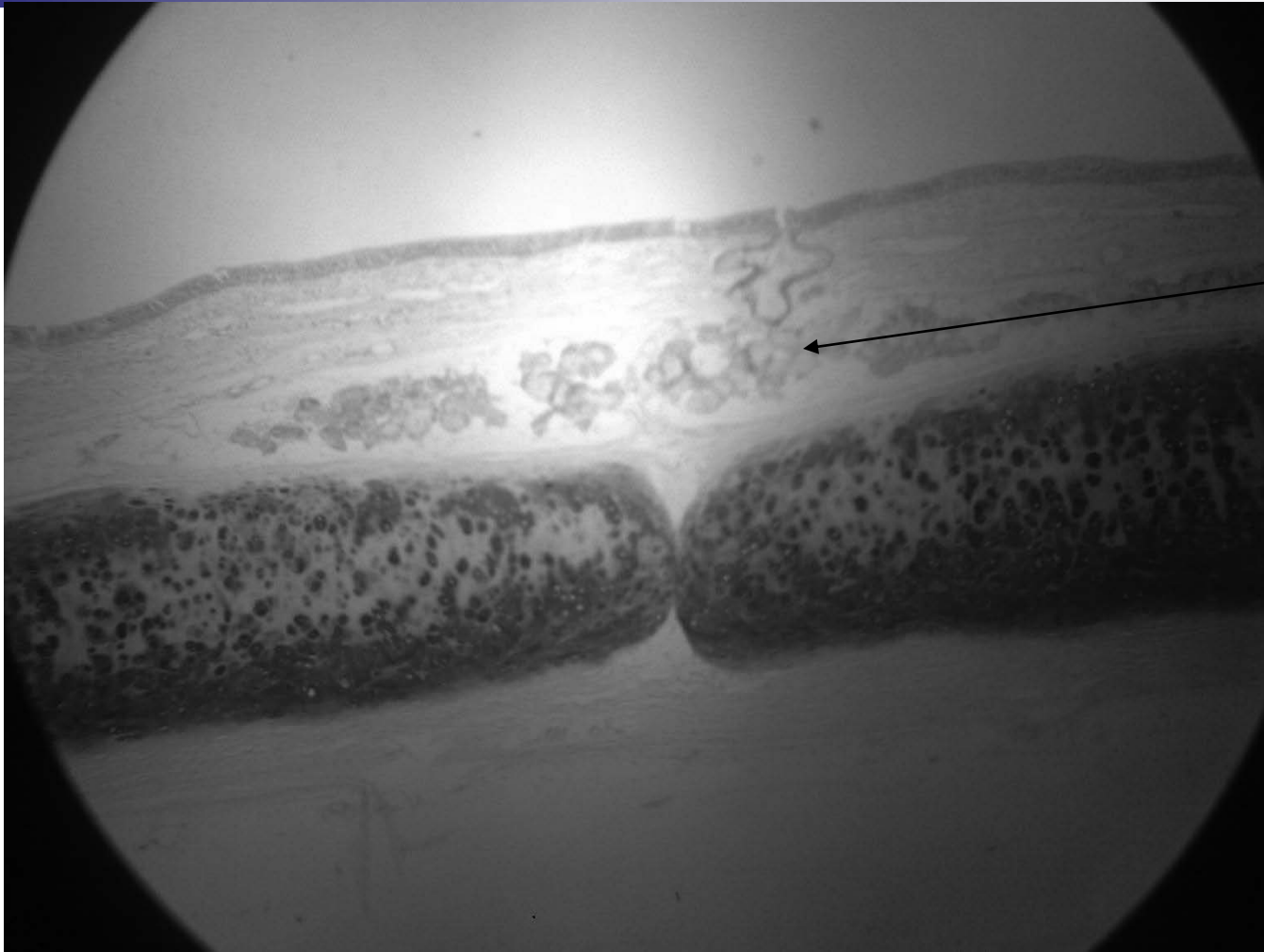
has the same composition of trachea except the
Hyaline cartilage in the 1ry bronchus is not
continuous



Hyaline cartilage in the primary bronchi

This is at the edge, showing one plate of hyaline cartilage, there's no lung tissue around, so it's a primary bronchus (extra pulmonary).

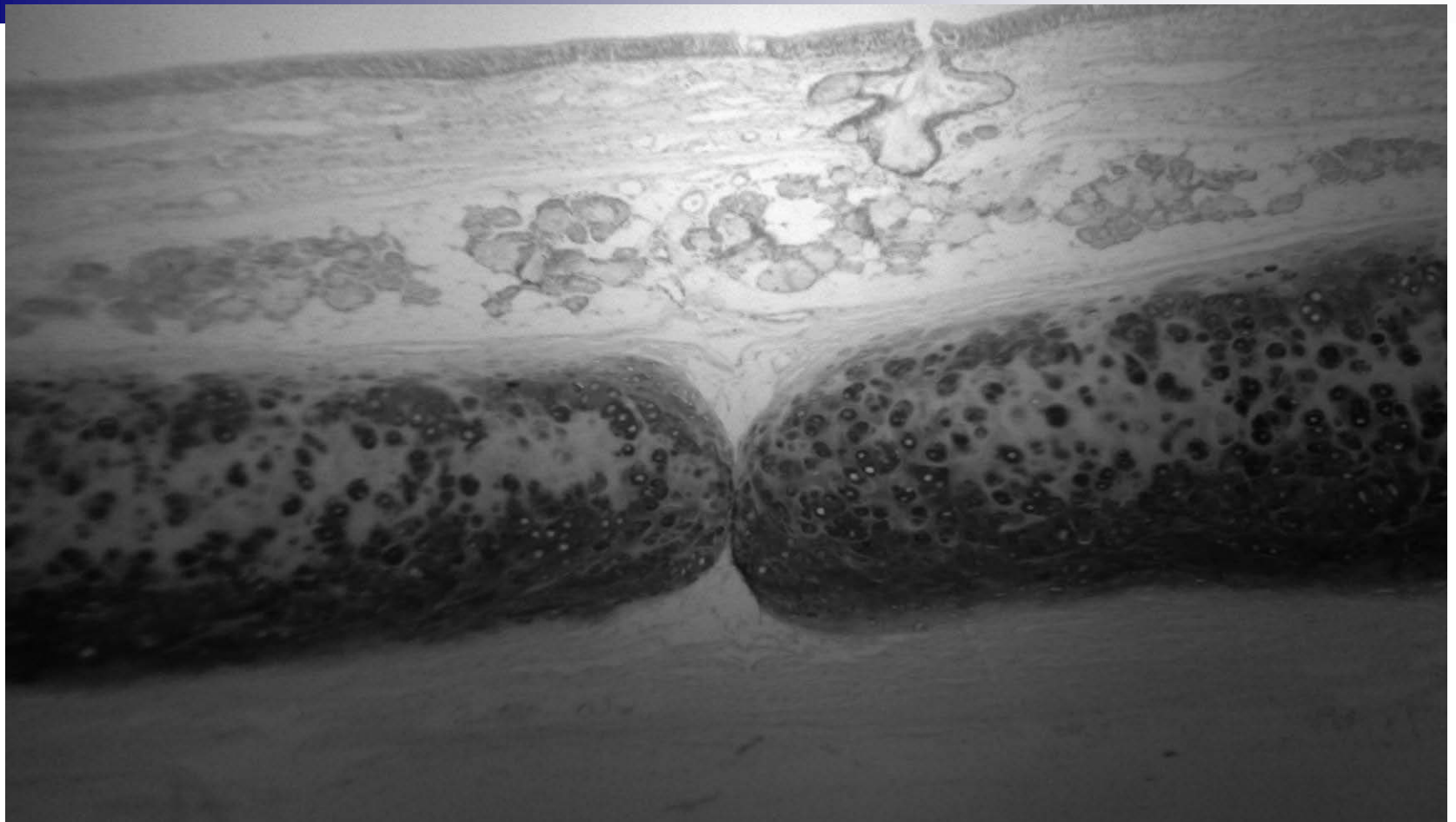
Note dr. AL-Mohtasib likes low magnification slides¹⁹



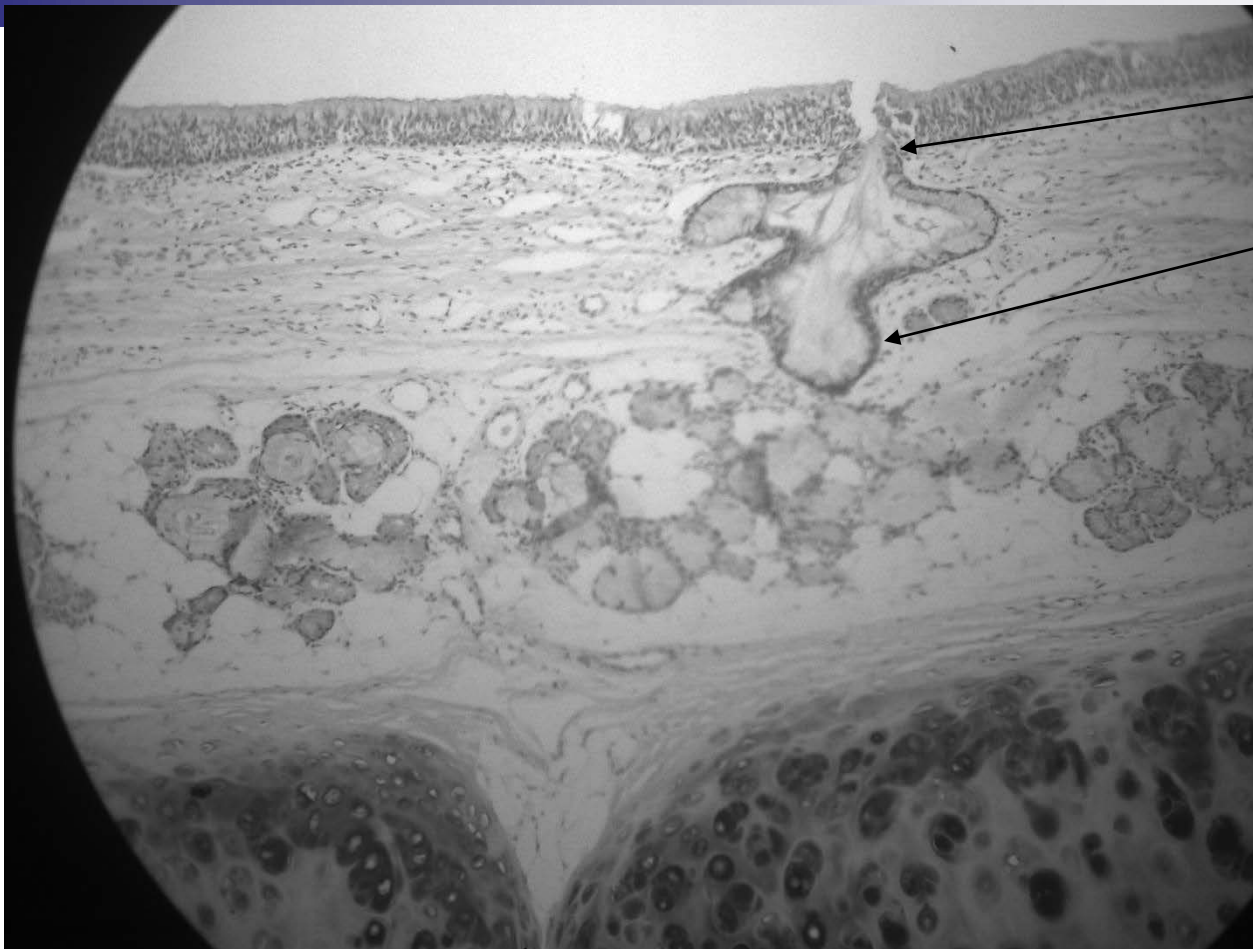
Seromucous
glands in the
submucosa

Hyaline cartilage in the 1ry bronchus.

Note how it's not continuous, it's in plates, but the plates are so close to each other somehow forming a c-shape.



The smooth muscle begins to appear frankly at this level and increases distally in contrast with glands & goblet cells



This duct
opened into
the surface

Serous
demilune

The primary bronchus

Notice the gland, it's a seromucous gland.

We say that it is the primary bronchus because there is no lung tissue.

Remember that we have extrapulmonary and intrapulmonary bronchi, and the primary is extrapulmonary while the 2ry and 3ry are intrapulmonary.

The layers are the same as those of the trachea. The only difference is the continuous plates of hyaline cartilage instead of the C shaped hyaline cartilage in the trachea.

There're still goblet cells

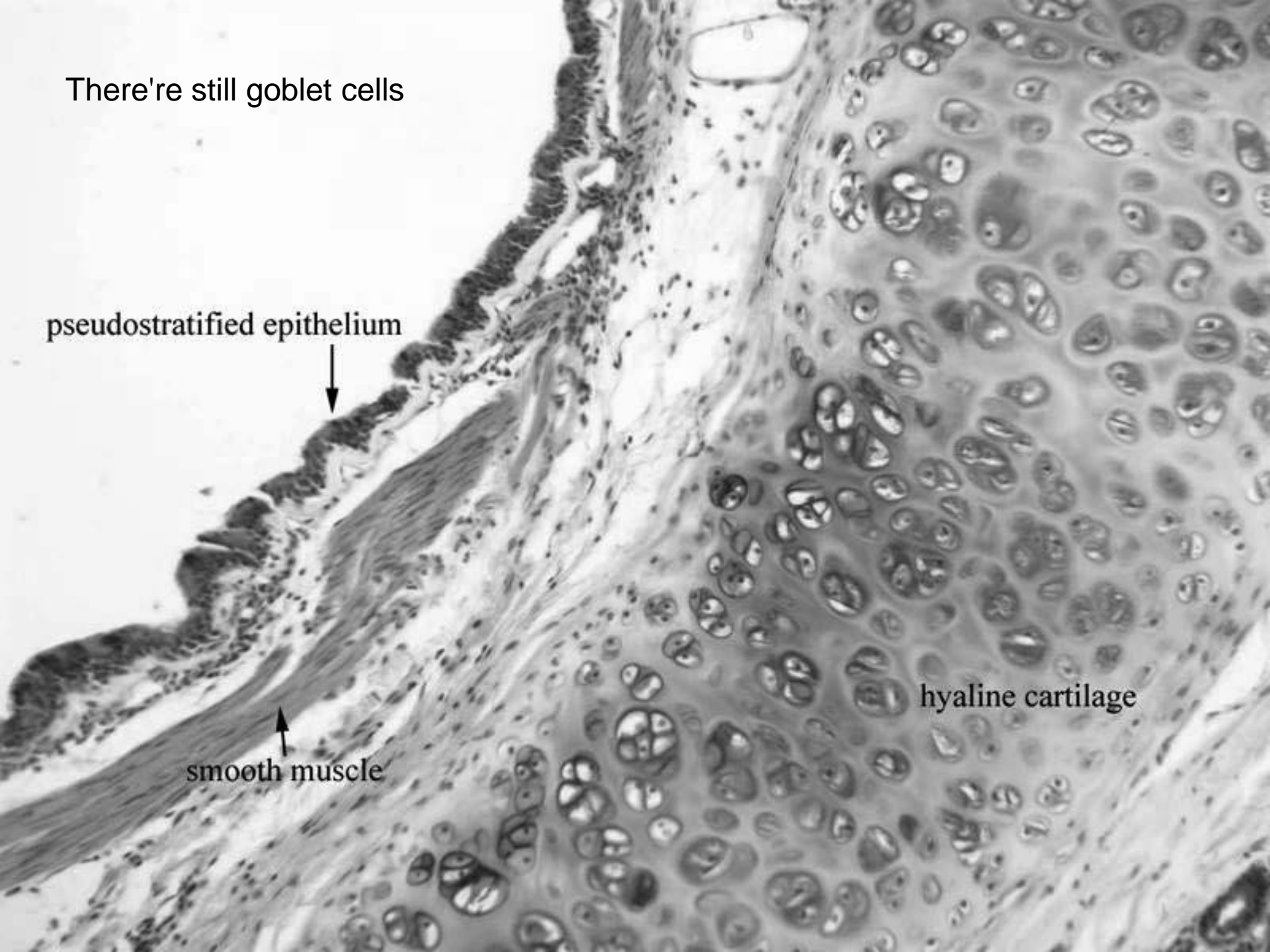
pseudostratified epithelium



smooth muscle



hyaline cartilage



lymphocytes



Scattered Lymphocytes in the submucosa and lamina propria

Violet in color

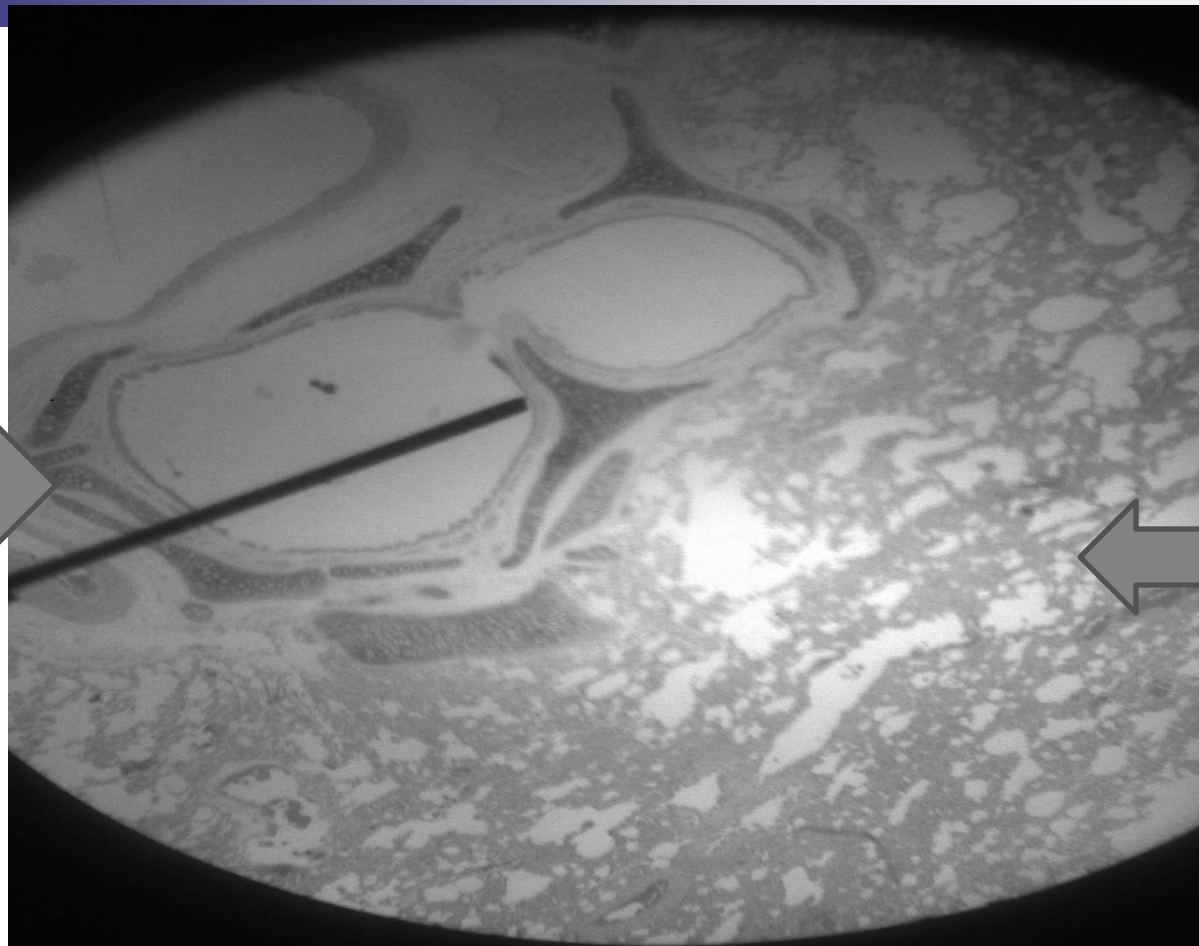
It increases in the respiratory system as we go distally because we inhale foreign bodies and bacteria so the immunity should increase .

The lymphocytes start to appear in nodules as we go distally in the respiratory system



The 2ry bronchus

Plates of
hyaline
cartilage
surrounding
the lumen



Lung tissue

The secondary bronchus.

Lobar bronchus.

Intrapulmonary bronchus, notice the lung tissue.

The lumen is narrower than that of the primary bronchus.

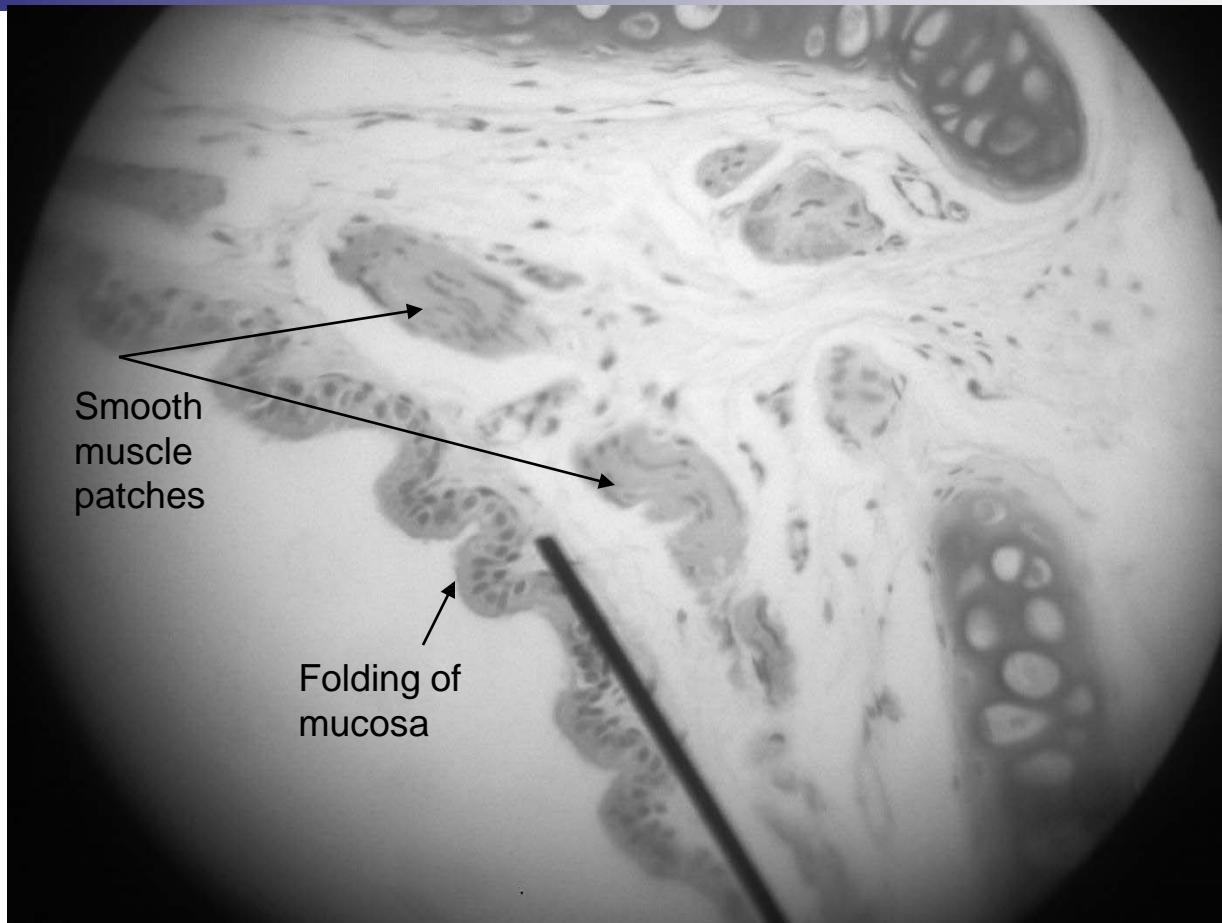
The hyaline cartilage is plates surrounding the bronchus.



Lymphatic aggregates within the wall of the secondary bronchi

The lymphatic cells here start to aggregate to get rid of pathogens (not scattered).

Note the changes are always gradual



The epithelium is pseudostratified ciliated columnar with goblet cells (foamy appearance)

The glands are present but less than before.

The glands & goblet cells decrease as we go distally.

Notice the lining epithelium starts to have foldings of mucosa due to the **patches** of smooth muscles.



Differences

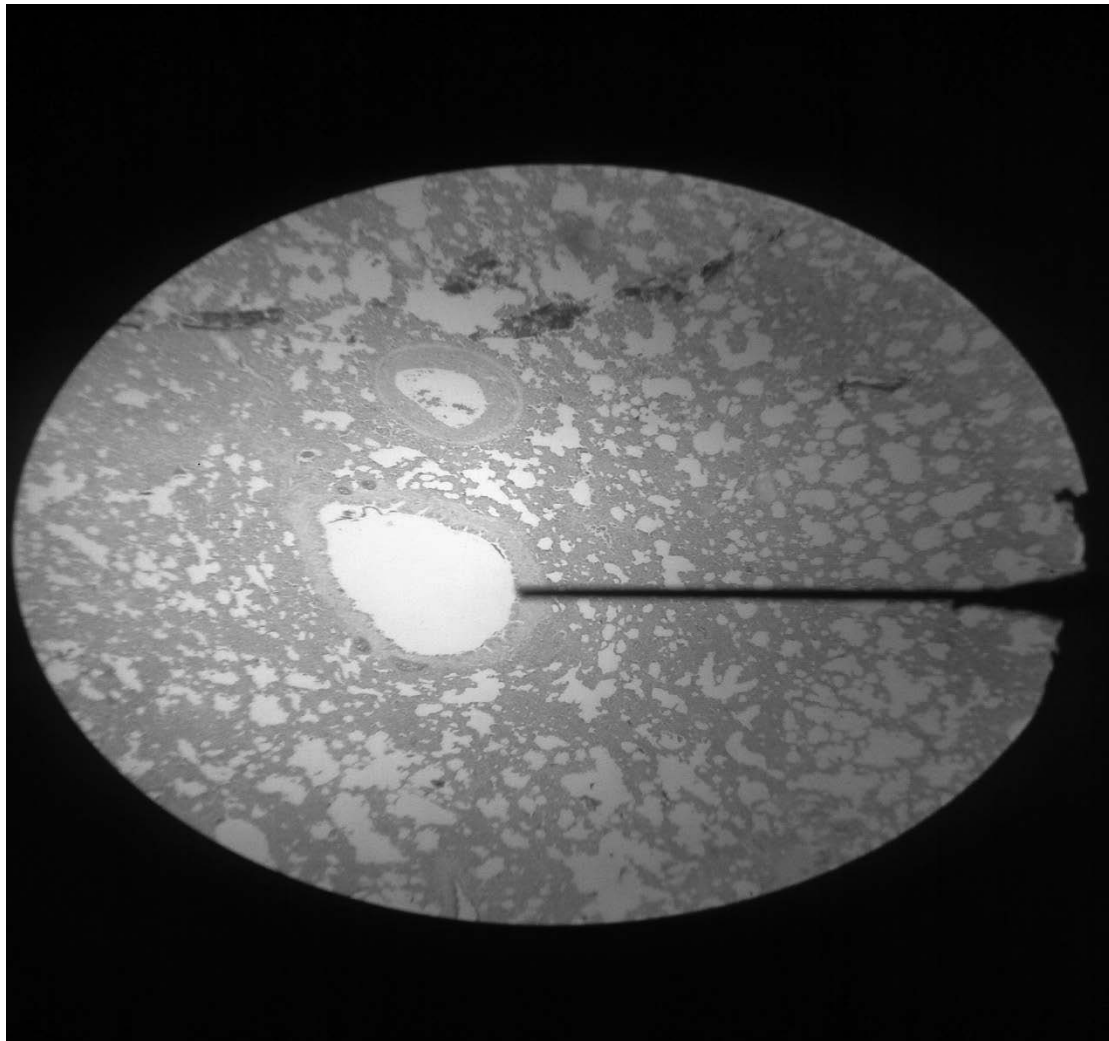
There are differences between the primary and the secondary bronchi:

- there is lung tissue around the secondary bronchi.
- the glands become less in the secondary bronchi.
- there is more smooth muscle in the secondary bronchi.
- there are lymphatic aggregates (not scattered cells) in the secondary bronchi.



The 3ry bronchus

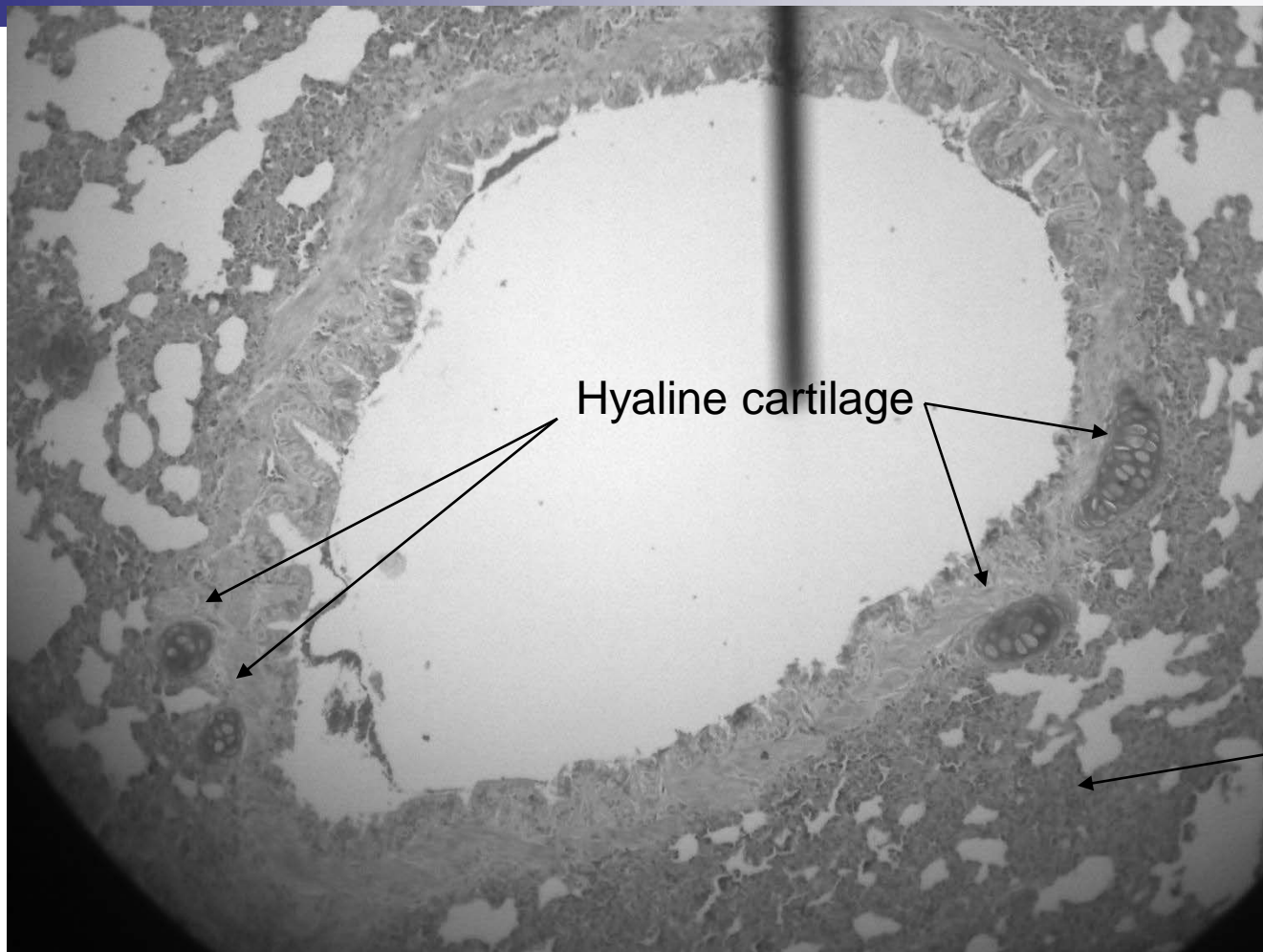
*** In asthma , the constriction is mainly in bronchiole since no hyaline cartilage



The tertiary bronchi

Bronchopulmonary segment.

Intrapulmonary, the lung tissue is more than that surrounding the secondary bronchi.



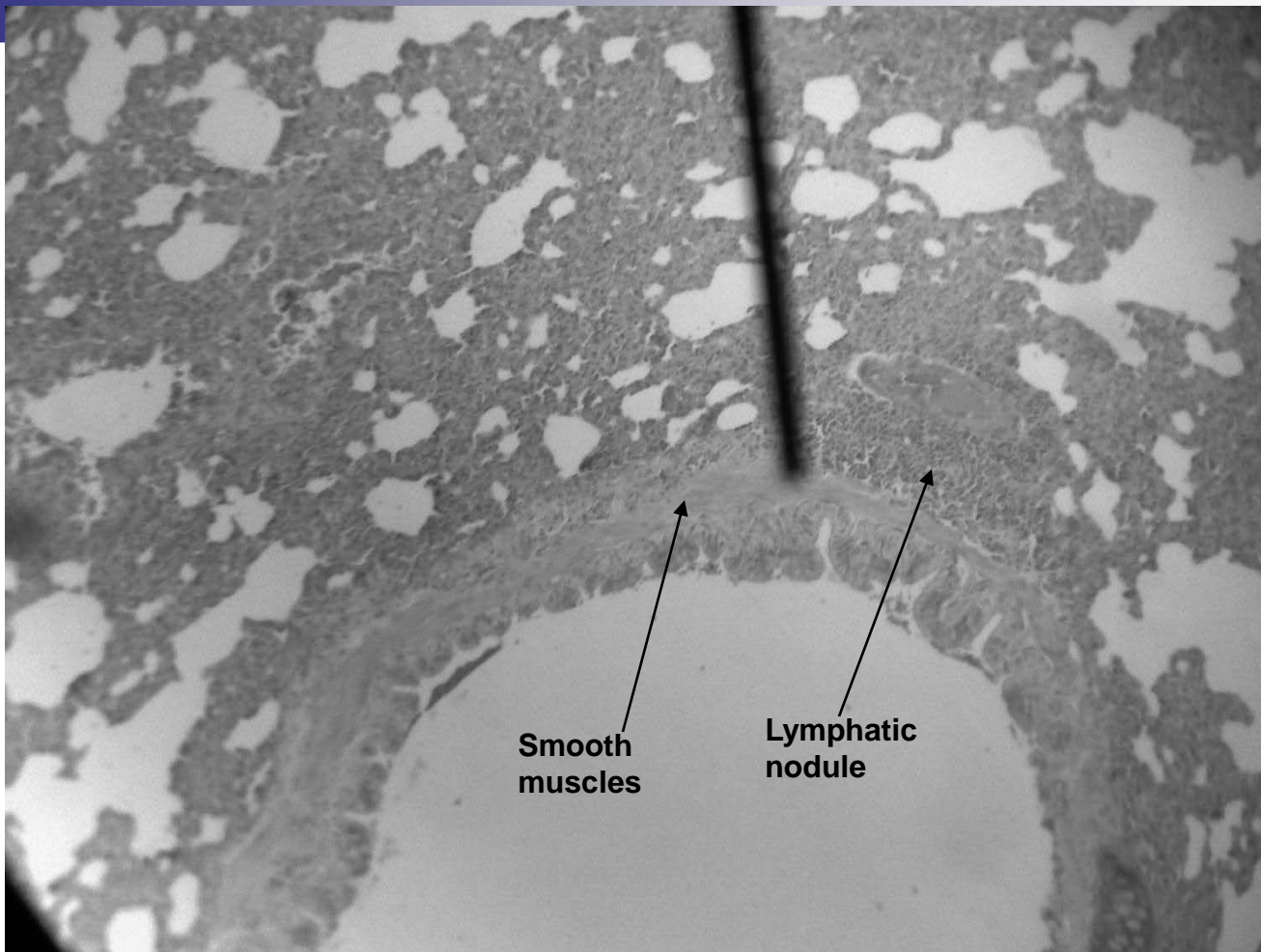
Hyaline cartilage

Lung
tissue

The tertiary bronch

The hyaline cartilage is one or two pieces , and that's what distinguishes the tertiary bronchus

The cartilage decreases as we go distally and it is replaced by smooth muscle.



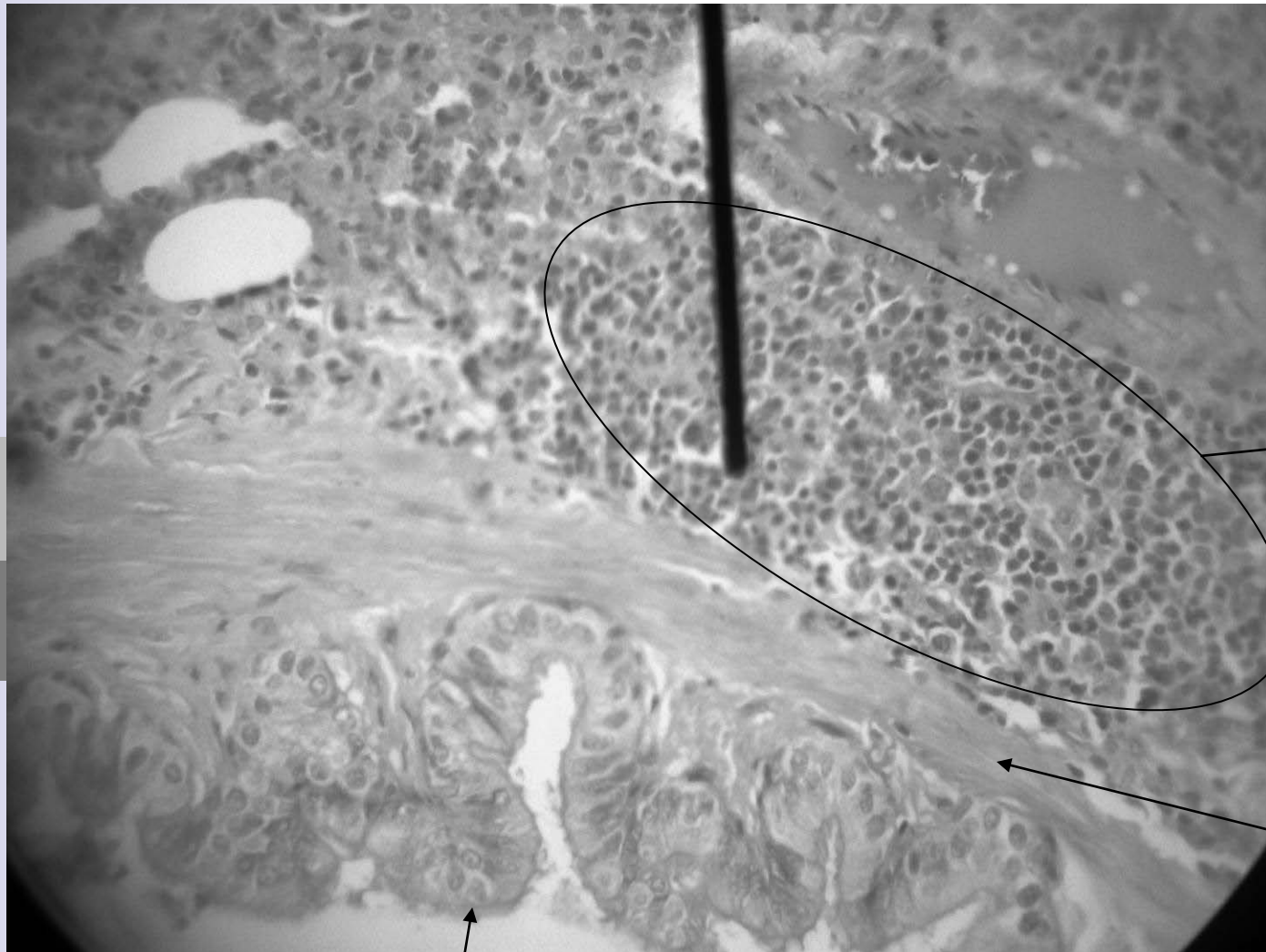
The tertiary bronchi

Notice the folding of epithelium, goblet cell becomes less .

The epithelium starts to become simple columnar ciliated in some places.

Large lymphatic nodule!!!

The smooth muscle, which is continuous here, is spiral only in the tertiary bronchi .
seromucous glands are absent.



Lymphatic
nodule

Thick
plates of
smooth
muscles

Mucosa is
simple columnar
ciliated

I've used last year slide as a backbone ;however , I've written down the new notes mentioned in the record

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لا نبالي بالقيود بل سنمضي للخلود
فلنجاهد و نناضل و نقاتل من جديد
غرباء هكذا الاحرار في دنيا العبيد
غرباء و لغير الله لا نحني الجباه
غرباء و ارتضيها شعارا للحياة

