

## Fine Needle Aspiration Biopsy in Oral Mass Lesions

Agoeng Tjahajani<sup>1</sup>; Titiek Setyawati<sup>2</sup>; Rosnah Zain<sup>3</sup>, Nurshaline<sup>3</sup>

<sup>1</sup>Department of Oral Biology, Faculty of Dentistry Indonesia University

<sup>2</sup>Department of Oral Medicine, Faculty of Dentistry Indonesia University

<sup>3</sup>Department of Oral Pathology and Medicine,  
Faculty of Dentistry Malaya University

### Abstract

**Background.** In many developing countries, like Indonesia, most patients with a oral mass lesions, i.e. infection, inflammation, even cancer came to the hospital at late stage of the diseases. Some of them afraid of endure suffering a killer disease, either after a biopsy or even should undergo an operation. Fine needle aspiration (FNA) biopsy is a technique rarely used to diagnose oral and oropharyngeal lesion. This technique seems promise a convenience, painless, accurate, safe, and easy to use to help patients and surgeons, and have been demonstrated repeatedly. **Objectives.** This case report emphasized many advantages of FNA biopsy to examine oral mass lesions and its metastasis to lymph node. **Materials and Methods.** Under a local anesthesia, Incisional biopsy and FNA biopsy were done on four cases of oral mass lesions. All samples were prepared for microscopic examination with Hematoxylin-Eosin (HE) staining and with Diff-Quick or Papanicolaou staining. **Results.** Incisional biopsy showed features of malignancy as the same as FNA biopsy. There were bigger cells with high ratio between cells and nucleus, hyperchromatic nucleoli, and mitotic cells that refers to Squamous cell carcinoma. FNA biopsy from the nearest lymph node showed clumps atypia cells, prominent nucleoli, nuclear hyperchromatic and pleomorphism. **Conclusion.** FNA biopsy could well diagnose on oral mass lesions and the adjacent lymph node. FNA biopsy has many advantages particularly its convenience, painless, ease to use, cost effectiveness, and accuracy.

**Key words:** FNA biopsy, histologic examination, oral mass lesions

### Introduction

Fine needle aspiration (FNA) biopsy and FNA cytology is a technique that is gaining popularity in the medical field<sup>1,2</sup> but its development was

slow.<sup>1</sup> FNA biopsy refers the operative procedure, whereas FNA cytology refers to the products which are aspirates. FNA biopsy or cytology refer to both the arts as a whole and for

the operative procedures and it is a relative new discipline. Different from exfoliate cytology that shows micro anatomical structure in addition to single cells and background materials.<sup>1</sup> While FNA cytology scrutinizes low power overall patterns of smear or aspirates more than single or groups of cells. Besides, its approach to diagnosis of smear or aspirate is closer to that used in histopathology more than exfoliate cytology.<sup>1,2</sup>

Incisional biopsy indicate a representative sample together with some adjacent tissue is taken, rather like a slice of cake and the incised normal tissue repaired by a suture (Figure 1)<sup>3</sup> FNA biopsy indicate a representative sample only on mass lesion area, ideal aspirate has a high cell content in small amount of fluid, creamy consistency, remains in lumen of needle (Figure 2)<sup>1</sup>. Unsatisfactory aspiration smears could produce when (b) the needle has missed the lesion tangentially; (c) central cystic or haemorrhagic area devoid of diagnostic cells; (d) small malignant lesion adjacent to dominant benign; (e) fibrosclerotic target tissue poor in cells (Figure 3).<sup>1</sup>

FNA biopsy has gained wide acceptance in many surgical and non surgical specialist. Its

accuracy<sup>1</sup>, cost effectiveness, convenient, painless and accuracy, safety and usefulness<sup>1,2,4</sup> have been demonstrated repeatedly for cancer of bone, thyroid, lymph node<sup>4,5,6,7</sup>.

The fundamental indication for FNA biopsy and Incisional biopsy is a lesion mass that is palpable or visible by a radiological imaging method; particularly useful for swelling of soft tissue not for a flat lesion<sup>1,8,9</sup>. It is necessary to obtain an adequate structurally preserved cellular sample to make an accurate diagnosis.

FNA biopsy can also be useful to verify recurrence or persistence of a neoplasm, confirm a suspected malignancy differentiate benign from malignant conditions, document malignancy for untreatable patients, evaluate metastasis of malignant disease.<sup>1,6,8,10,11</sup> Further improvement of the diagnostic accuracy of FNA biopsy depends on the accuracy of clinical information<sup>12</sup>, as well as to confirm a suspected malignancy; or to evaluate a metastasis of malignant disease<sup>1,8,11</sup> the cytopathologist or well-trained medical officers<sup>2,9,13,14</sup> the ultrasound or radiological guidance<sup>12,15</sup>, the careful and expert of preparing sample.<sup>4,12</sup>

## **Case Reports**

### **Case 1**

A 28 year Malay female complained of ulcer on right tongue four months ago and often traumatized. Clinical examination revealed indurations on right dorsum tongue deep to floor of the mouth, diameter 3.5 cm; tongue mobility is good. An incisional biopsy was done. Histopathological finding reported rete pegs abnormal, island of epithelial cells invasive to submucosa (Figure 4), bigger nuclei, picnotic nucleoli, and abnormal mitotic (figure 5). FNA biopsy was carried out on the floor of the mouth and lymph node. Cytological examination showed clumps of cells showing cellular atypia, prominent nucleoli, nuclear hyperchromatic and pleomorphism (figure 6); in addition many spreading of lymphoblast were seen (Figure 7).

### **Case 2**

A 64 year Indian male presented a non healing ulcer on left upper lip three months ago, pain when eating. Medical history revealed diabetic, betel quid chewer for 15 year and social drinker. Oral examination revealed reddish ulcerated lesion, tender on palpation. An incisional biopsy was done. Histopathological findings showed focus-

focus of keratinized islands (figure 8), crowded of bigger nuclei and exhibit stratification, abnormal mitotic (figure 9). FNA biopsy was done. Cytological examination showed spindle-shaped and binucleated cell (Figure 10).

### **Case 3**

A 70 year Indian female presented an over growth lesion at left upper buccal sulcus. Medical history was unremarkable. She is a betel quid chewer since young and just stop 2 months ago. Clinical examination revealed erythematous and whitish lesion on left upper buccal sulcus 27, 28; tender to palpation. An incisional biopsy was done. Histopathological examination showed cells closely resemble to the epithelial cells; many island of plugging keratin (figure 11). FNA biopsy was done. Cytological examination showed larger nucleoli, clumps of hyperchromatic nucleoli (Figure 12).

### **Case 4**

A 43 year Chinese male presented an ulcer on tongue. He is a non smoker and non drinker. Clinical examination revealed ulcer 1.5 x 0.5 cm, indurate margin 4 x 1.5 cm, lesion extend from right lateral border to ventral surface tongue.

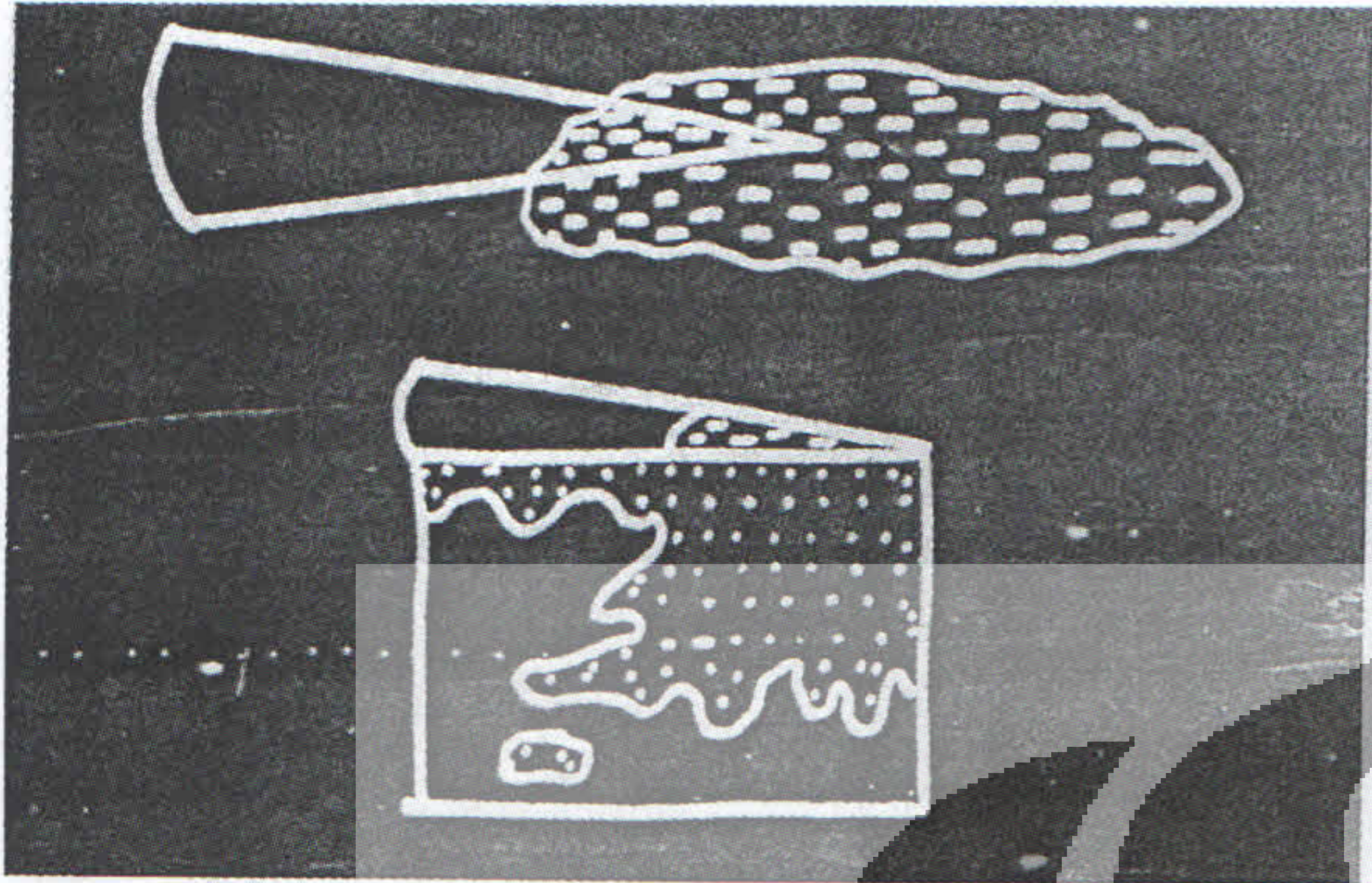


Figure. 1. Incisional biopsy procedure

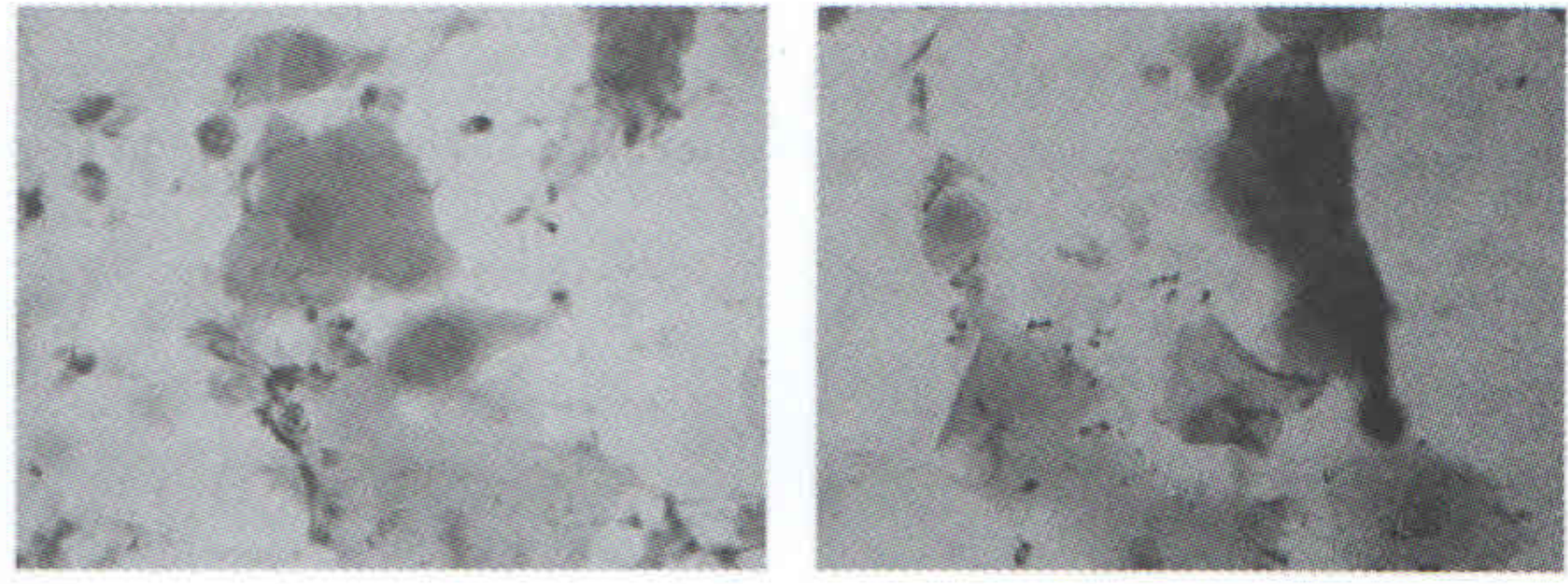


Figure 5. cellular atypia, prominent nucleoli

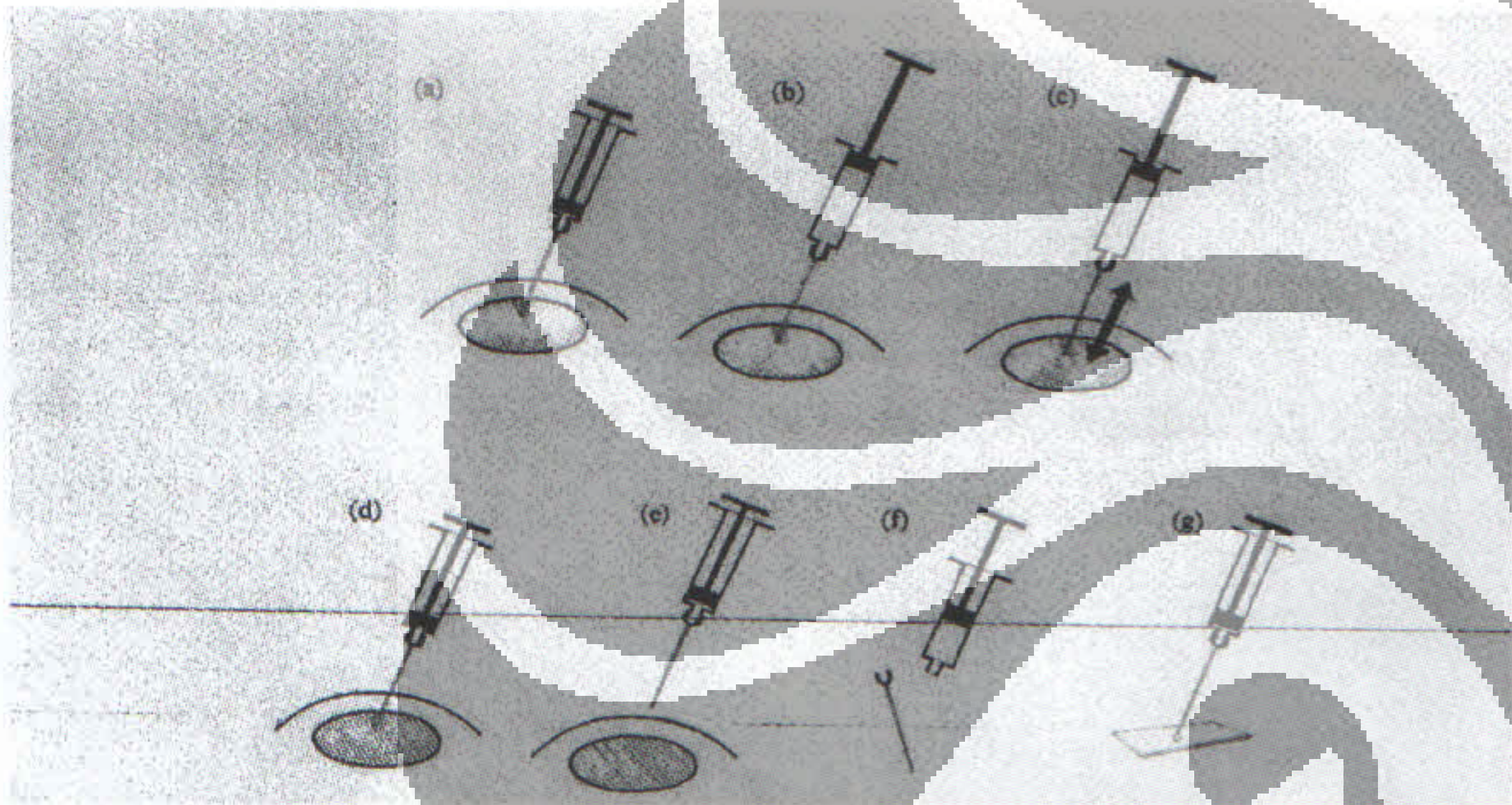


Figure. 2 Fine Needle aspiration procedure



Figure 6. Bigger nuclei, picnotic nucleoli, mitotic abnormal

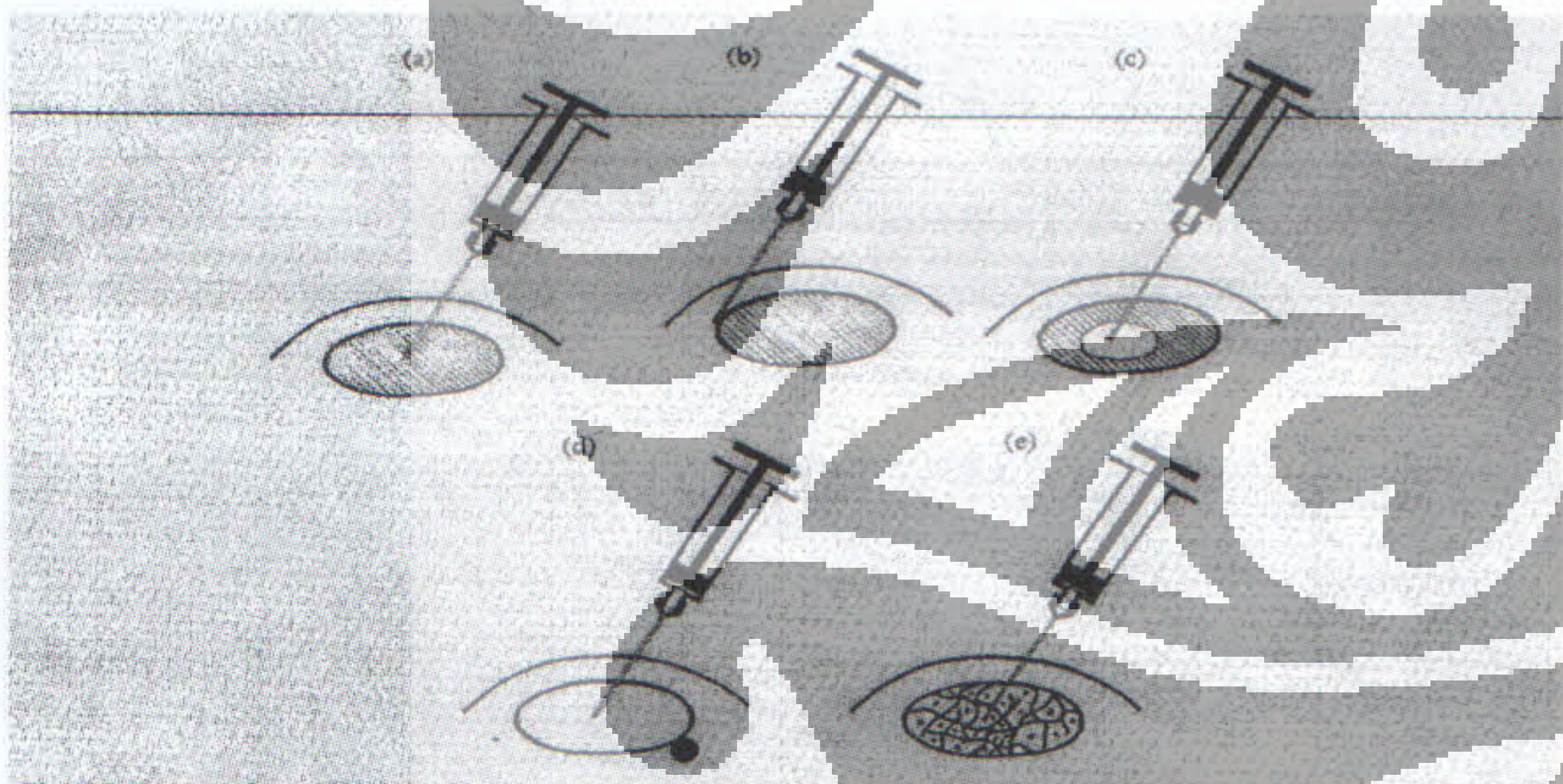


Figure 3. Causes for unsatisfactory yield



Figure 7. spreading of lymphoblast

Case # 1

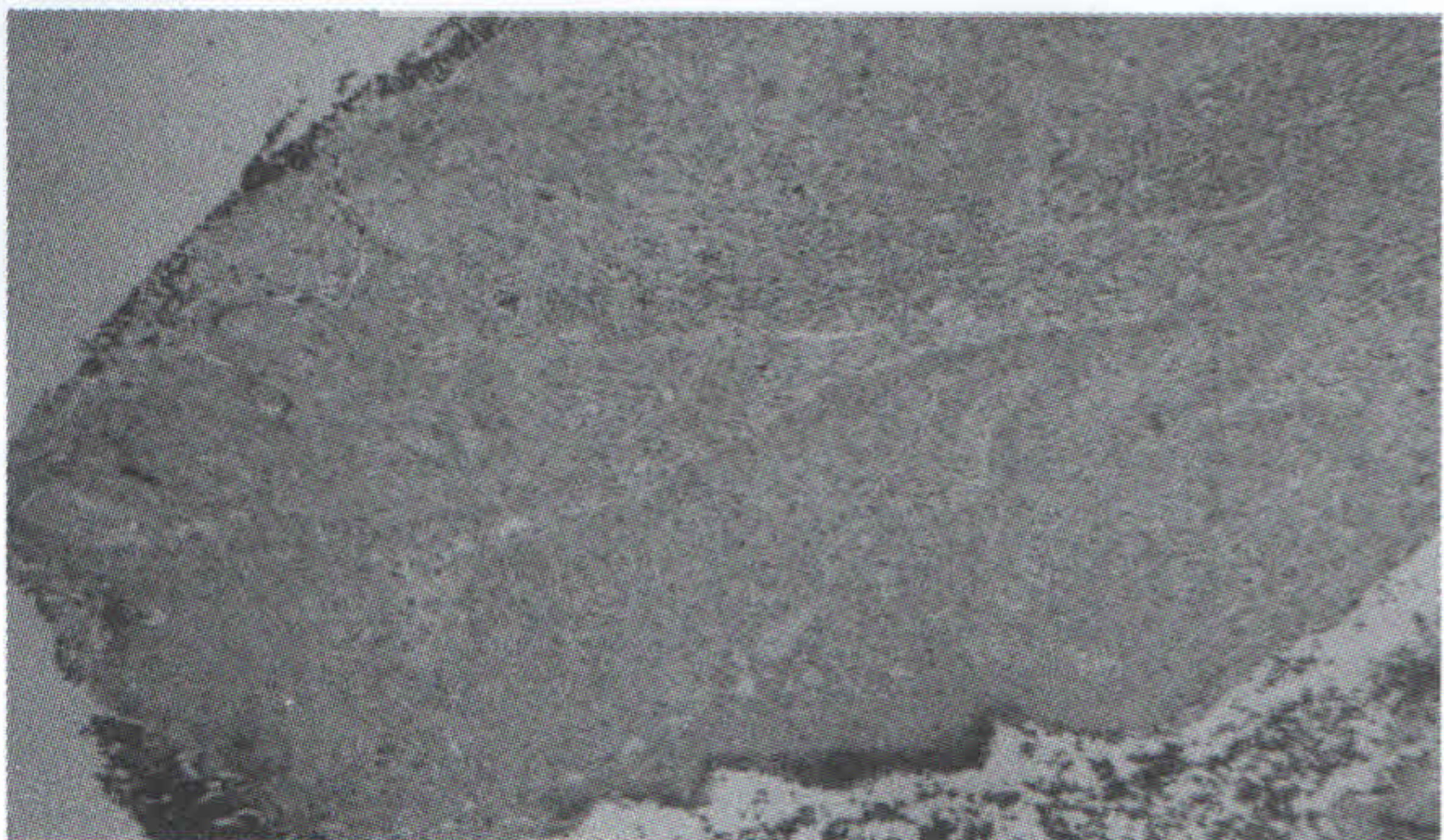


Figure 4. Abnormal rete pegs, island of epithelial invasive to submucosa

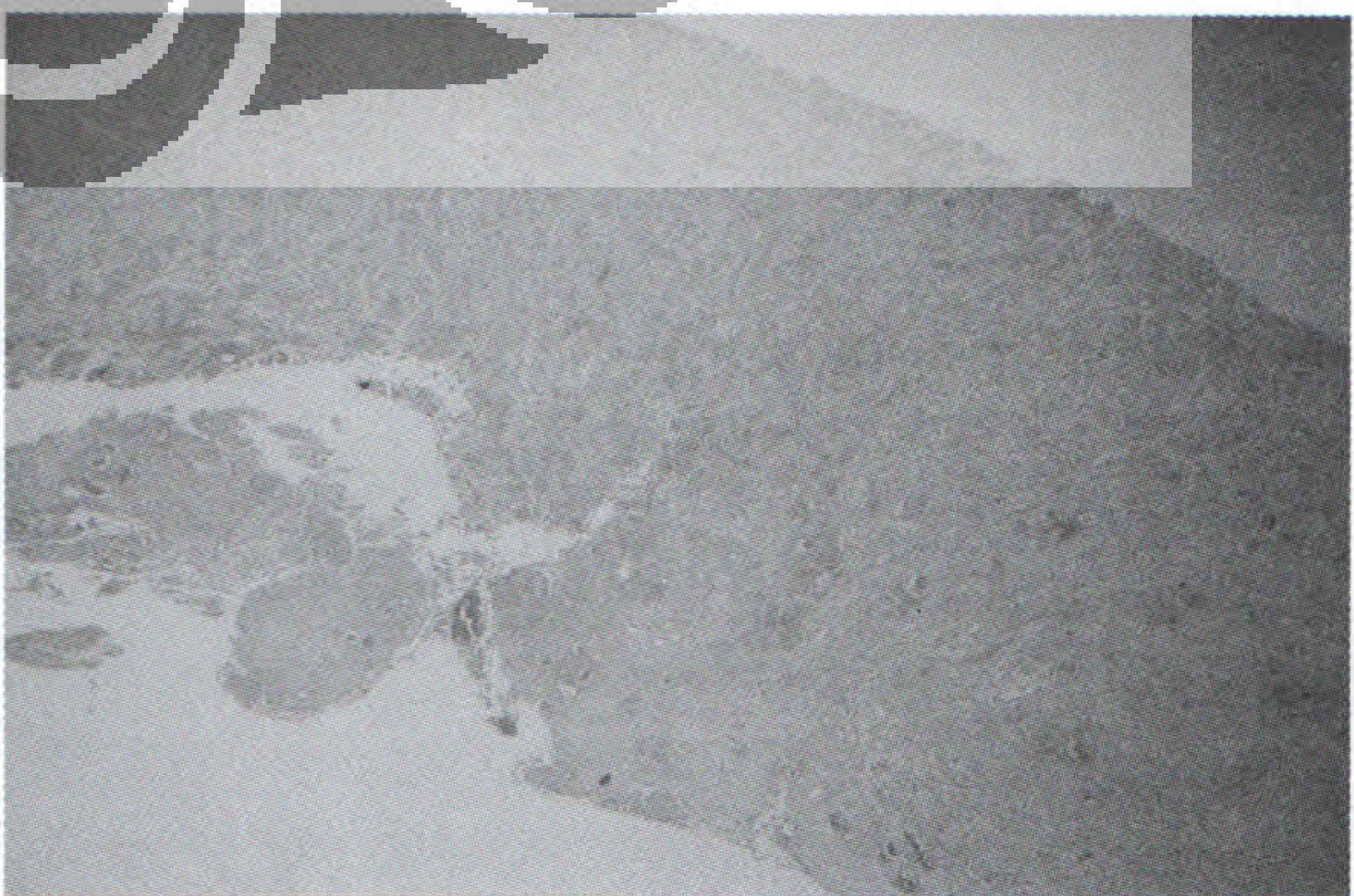


Figure 8. focus of keratinized island

case # 2

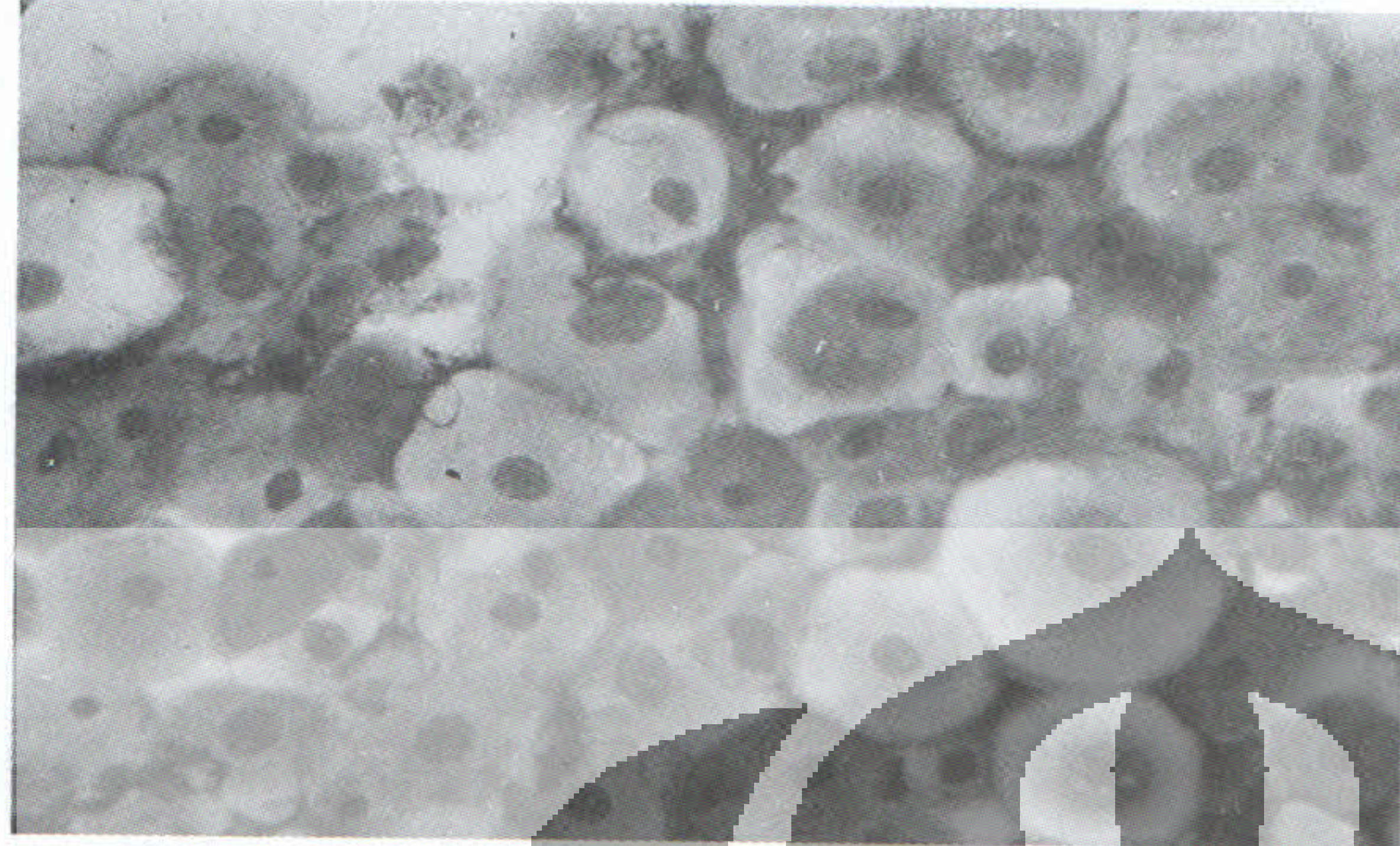


Figure 9. crowded bigger nuclei and mitotic cells

Case # 4

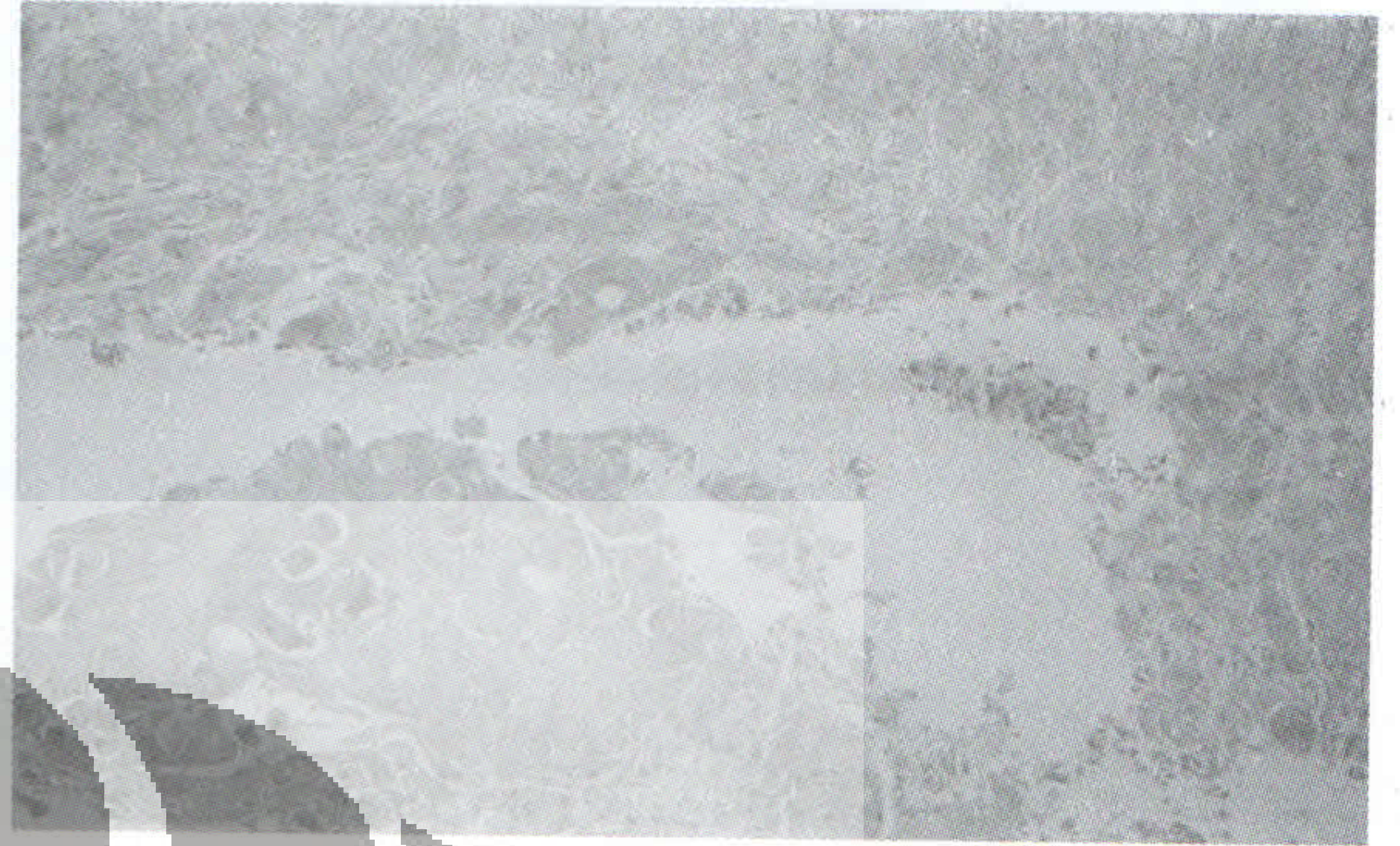


Figure 13. Islands of epithelial cells , Epithelial pearl

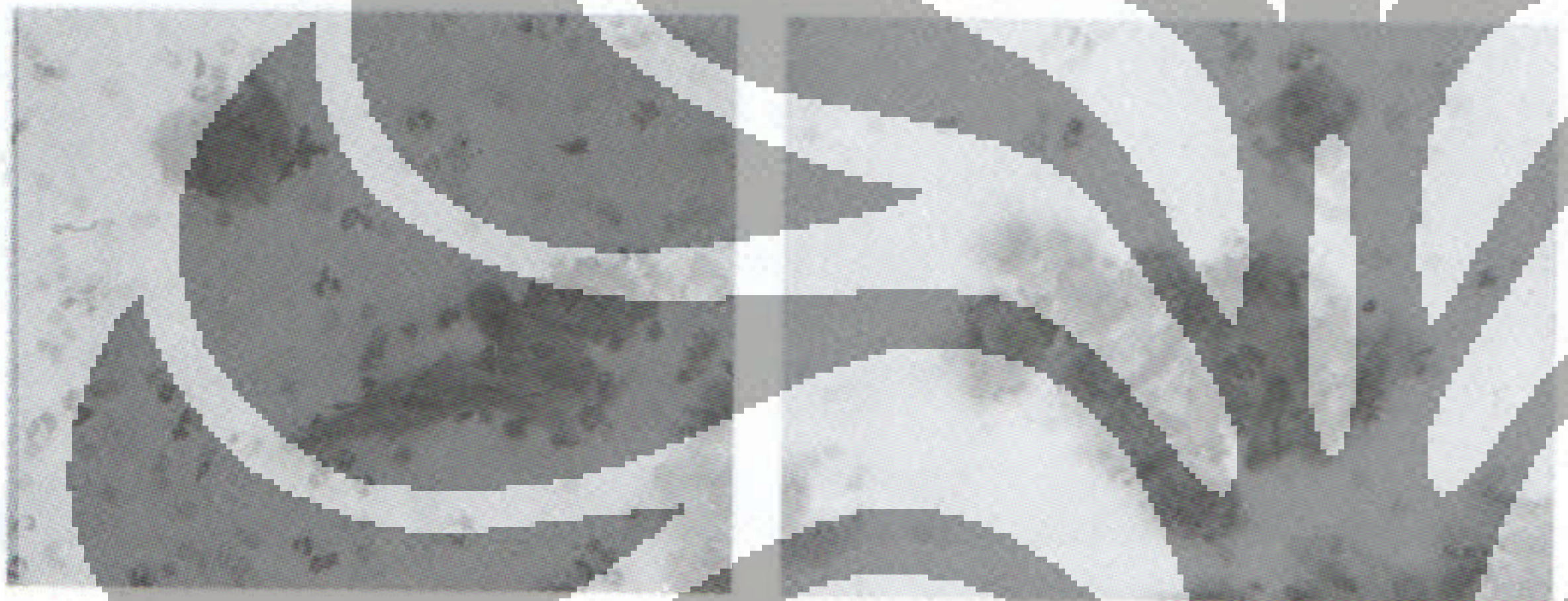


Figure 10. spindle-shaped and binucleated cells

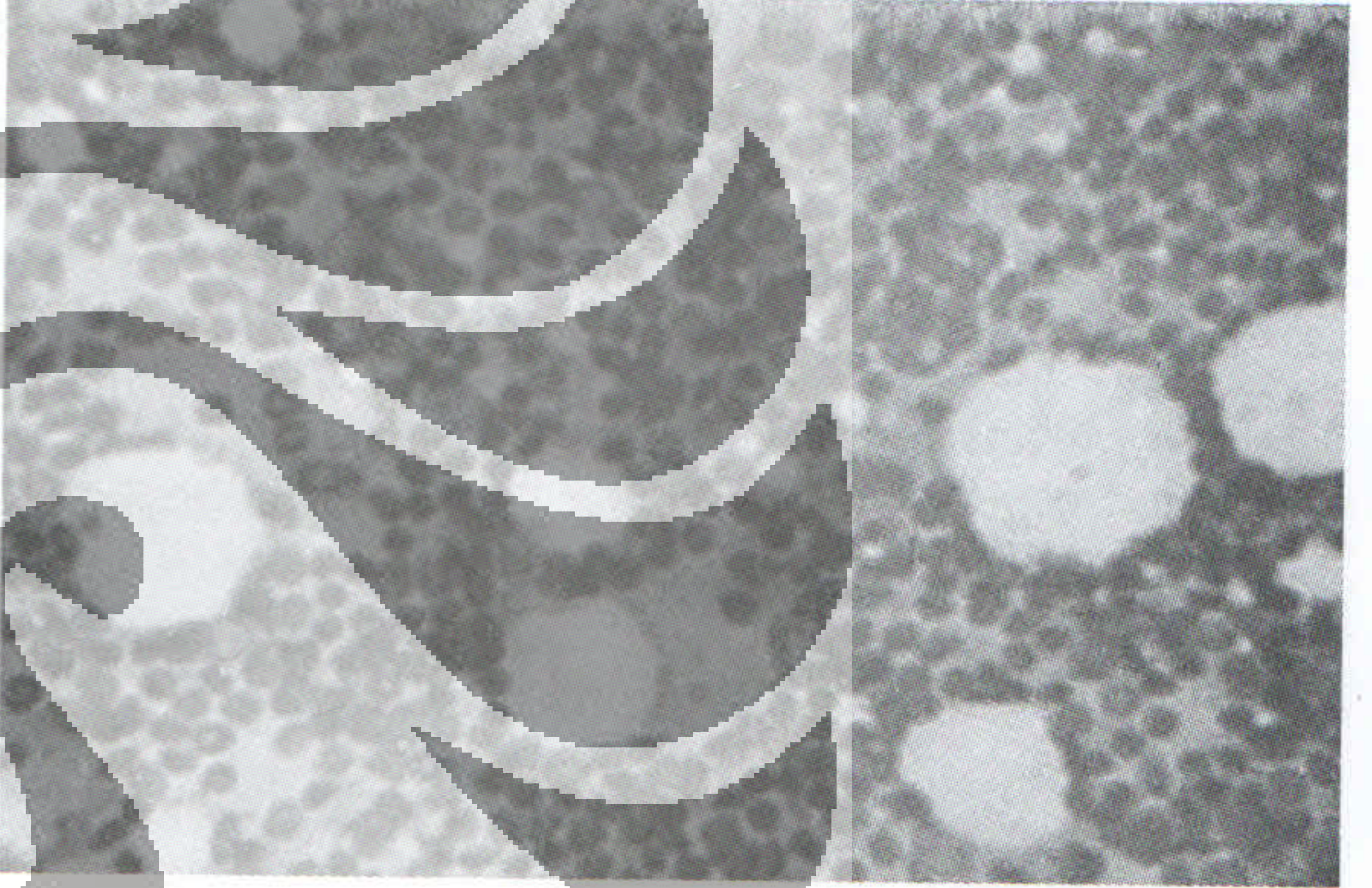


Figure 14. Lymphoid hyperplasia

Case # 3



Figure 11. Cells resemble to epithelial cells and plugging keratin

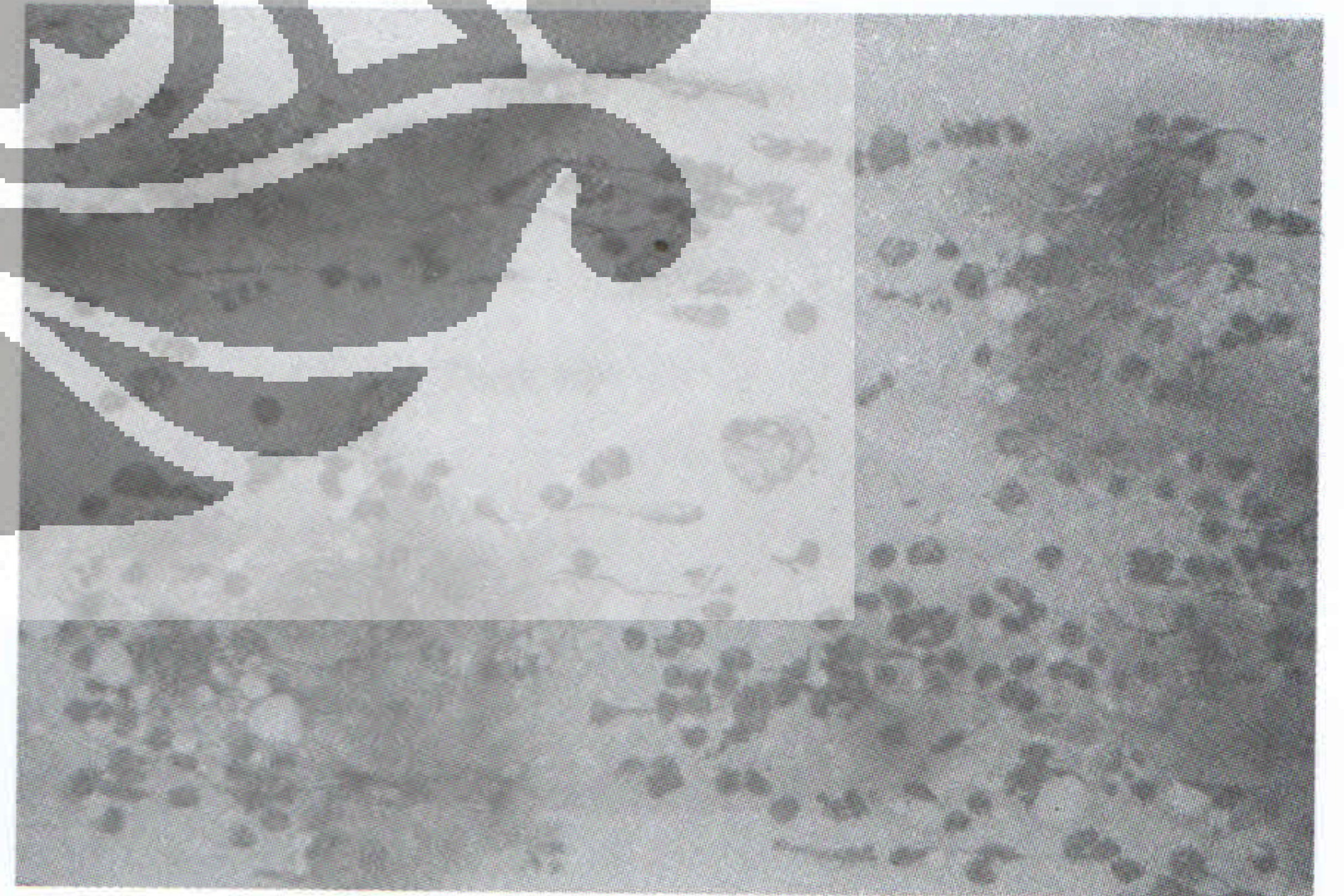


Figure 15. Larger nuclei, high ratio between nucleus and cytoplasm, clumps of hyperchromatic nucleoli, abnormal mitotic.

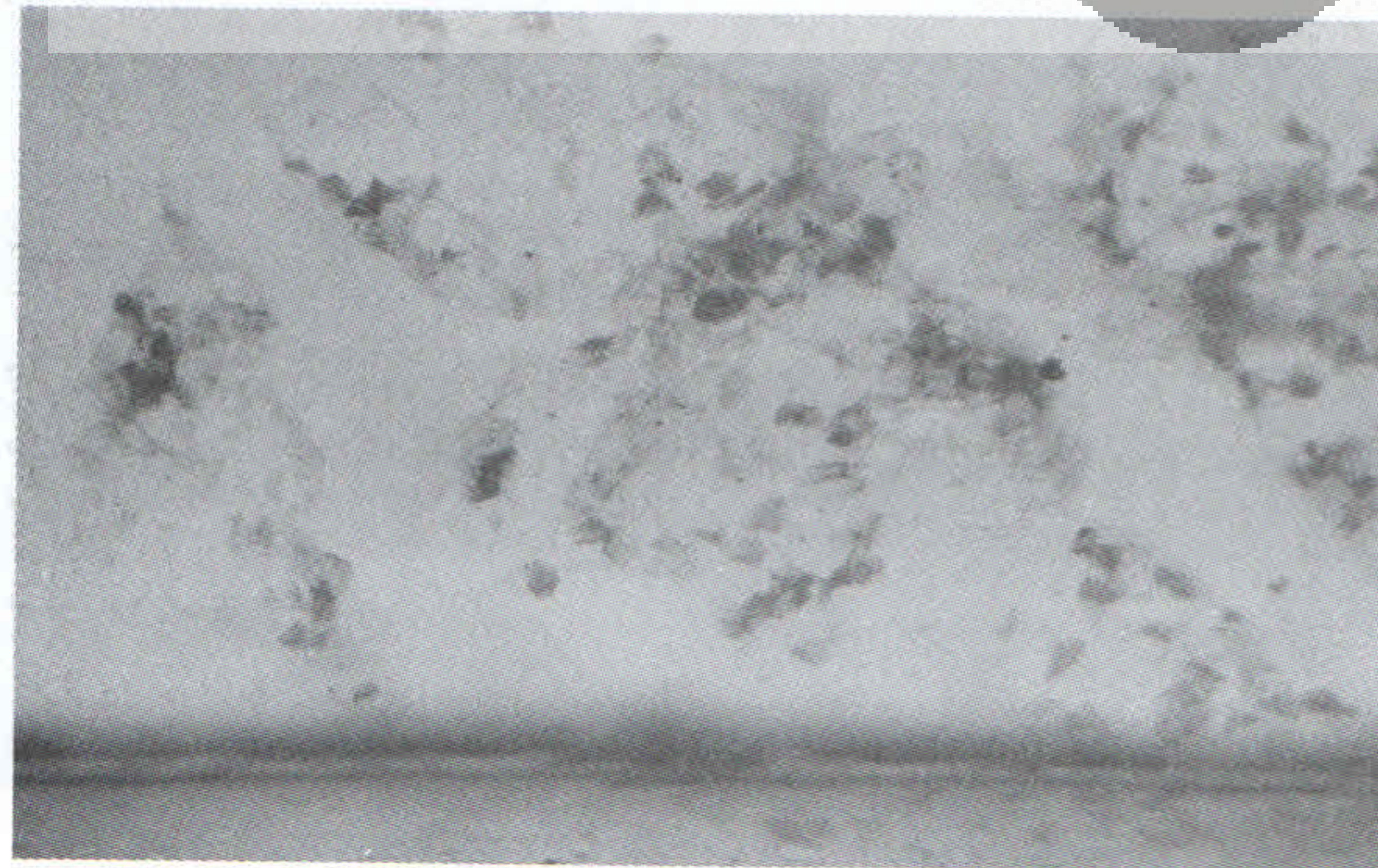


Figure 12. clumps of hyperchromatic nucleoli

Tongue movement normal and no aesthesia. An incisional biopsy was done. Histopathological finding showed many islands of epithelial cells, epithelial pearl (figure 13). FNA biopsy was done on right submandibular lymph node. Cytological examination revealed lymphoid hyperplasia (Figure 14) and larger nuclei, high ratio between nucleus and cytoplasm, clumps of hyperchromatic nucleoli, abnormal mitotic (Figure 15).

### Discussion

The accurate diagnosis and correct management of these oral mass lesions requires histologic and cytologic diagnosis which is usually obtained by incisional biopsy and FNA biopsy. While it is relatively easy to perform, a certain degree of surgical skill<sup>16</sup> and cytopathologist, or cytopathology fellow, or a well-trained medical officer is needed<sup>1,8,10</sup>. However, in these cases, aspirates were performed consistently and similarly by the physicians and medical officer which are not well trained before. Because of that reasons, all cases were observed by histological and cytological examination.

Our case report of oral mass lesions demonstrated histologic and cytologic findings between incisional biopsy and FNA biopsy showed similar features of Squamous cell carcinoma on oral mucous and its metastasis to lymph node. Both microscopic findings showed bigger nuclei, nuclear atypia, picnotic and prominent nucleoli, hyperchromatic and pleomorphism nuclei, high ratio nucleus and cytoplasm, abnormal mitotic. Previous literature demonstrated that abnormal keratinized anucleated cells with a globoid or bizarre shape and occasional cells with enlarged hyperchromatic nuclei may provide the only clue to the diagnosis of squamous cell carcinoma<sup>13</sup>, and cluster of atypical squamous cell with varying degrees of keratinization and nuclear atypia, hyperchromatic and elongated nuclei, many anucleated squames, spindly or bland squamous cells, and keratin material<sup>11</sup>.

FNA biopsy has the advantage of being a quick technique requiring a minimum of equipment. The biopsy specimen can easily be taken at patient's initial clinic visit allowing a more rapid diagnosis and facilitating more efficient oral mass lesion management and fewer

visits to hospital. Previous study reported that FNA biopsy is very safe<sup>1,8,11</sup>, useful<sup>1,2,8, 10</sup>, accurate<sup>2,5,11</sup>; rapidity for early or preliminary diagnosis,<sup>1,2,8,10,11</sup>; this technique can also be performed safely in children<sup>4</sup> and to obtain tissue samples of oral and oropharyngeal lesions<sup>9,11</sup>.

Specimen obtained by FNA biopsy compare very favorably with those obtained by incisional biopsy. Few previous study found 91% concurrence rate between FNA biopsy and surgical diagnosis with no false positive<sup>1</sup>. There is no failure rate was consistent with rates of 1.4 – 33%<sup>10</sup>, and accurate 86.6% in diagnosis of oral and oropharyngeal lesions<sup>11</sup>, and an accurate rate rarely less than 80% on oral cancer<sup>8</sup>.

False negative cytologic diagnosis may be due to low cellularity or non-representative sample of the actual lesion. In addition, clinically, some of these lesions are relatively small and superficial making it difficult to reach for precise sampling. Other study had similar findings and suggested that false negative FNA cytology is most likely related to inadequate specimen or sampling<sup>11</sup>.

Traditionally, there have been worries that FNA biopsy can cause seeding of malignant cells along the needle tract,<sup>1,7</sup>. Besides, a literature search has revealed only 3 cases of seeding in FNA biopsy<sup>5</sup>, while the needle recommended not larger than 20 gauges<sup>1</sup>.

### **Conclusion**

FNA biopsy showed an accurate microscopic features as the same as Incisional biopsy, but its safe enough, simple, convenient, painless, inexpensive, and comfortable to the patients, does not typically present a problem and does not leave a scar. This technique can also be done on lymphoid node to know its metastasis. When it performed by surgical medical officers and assist by a Cytopathologist, it can provide a better service to the patient.

### **References**

1. Platt JC. Fine needle aspiration biopsy in oral and maxillofacial surgery. *Oral Surg Oral Med Oral Pathol.* 1993; 75: 152 – 55
2. Turbat-Herrera EA, Knowles K. Cytology: screening or diagnostic tool? *Human Pathol* 1998; 29 (12): 1356-66

3. Bramley PA and Smith CJ. Oral Cancer and precancer: establishing a diagnosis. *BDJ* 1990; 168: 103-7.
4. Mehrota R, Singh M, Singh PA, Mannan R, Ogha, VK, Singh P. Should Fine Needle Aspiration Biopsy be the first pathological investigation in the diagnosis of a bone lesion? *Cytojournal* 2007; 4:9.
5. Agrawal S, Agrawal T, Agrawal R, Agrawal PK, Jaim UK. Fine Needle Aspiration of the bone tumours. Handa U, Bal A, Mohan H, Bhardwaj S. Fine Needle Aspiration Cytology in the diagnosis of bone lesions. *Cytopathol Cancer Detect Prev* 2000; 24: 606-9.
6. Nguyen GK, Lee MW, Ginsberg J, Wragg T, Biloden D. FNA of the thyroid. *Cytojournal* 2005; 2(1):12
7. Gupta N, Nijhawan R, Srinivasan R, Rajwanshi A, Dutta P, Bhansaky A, Sharma S. FNAC of primary thyroid lymphoma. *Cytojournal* 2005; 2:21
8. Kaur G, Sivakumar S. Comparison of Unsatisfactory Aspirates in Fine needle Aspiration Performed by Surgical Officers and Pathologists. *J of Cytology* 2007; 24(2) : 82-4
9. Seone J, Varela-Centelles PI, Ramirez JR, Camselle-Teijeiro J, Romero MA. Artefacts in oral incisional biopsies in general dental practice: a pathology audit. *Oral Disease* 2004; 10: 113-7.
10. Nggada HA, Khalil MA. Fine Needle Aspiration Cytology Technique as a Diagnostic tool of Tumourism in The University of Maiduguri Teaching Hospital Nigeria. *Highland Med Res J* 2003; 1(3):28-30
11. Saleh HA, Clayman L, Masri H. Fine Needle Aspiration biopsy of Intraoral and Oropharyngeal mass lesions. *Cytojournal* 2008; 5:4-7
12. Handa U, Bal A, Mohan H, Bhardwaj S. Fine Needle Aspiration Cytology in the diagnosis of bone lesions. *Cytopathology* 2005; 6: 100.
13. Orell SR. Pitfalls in fine needle aspiration cytology. *Cytopathology* 2003; 14: 173-8
14. Seone J, Varela-Centelles PI, Ramirez JR, Camselle-Teijeiro J, Romero MA. Artefacts in oral incisional biopsies in general dental practice: a pathology audit. *Oral Disease* 2004; 10: 113-7.
15. Singh N, Ryan D, Berney D, Calaminici, Sheaff MT, Welis CA. Inadequate rates are lower when fine needle aspiration cytology samples are taken by cytopathologist. *Cytopathology* 2003; 14: 327-31
16. Rice JC, Zaragoza P, Waheed K, and Schofield J, Jones CA. efficacy of incisional vs punch biopsy in the histological diagnosis of periocular skin tumours. *Eye* 2003; 17: 478-81.