undergone to explore the function of HMGB1 in the pathogenesis of pemphigus, and achieve a new therapy method by inhibiting their interaction.

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REFERENCES

1. Andersson U, Tracey KJ. HMGB1 is a therapeutic target for sterile inflammation and infection. *Annu Rev Immunol* 2011;29:139-162.
2. Lotti R, Marconi A, Pincelli C. Apoptotic pathways in the pathogenesis of pemphigus: targets for new therapies. *Curr Pharm Biotechnol* 2012;13:1877-1881.
3. Chiapa-Labastida M, Zentella-Dehesa A, León-Dorantes G, Becker I. Pemphigus vulgaris: accumulation of apoptotic cells in dermis and epidermis possibly relates to pathophysiology through TNF-alpha production by phagocytes. *Eur J Dermatol* 2011;21:874-888.
4. Chen T, Guo ZP, Li L, Wang L, Jia RZ, Cao N, et al. Increased HMGB1 serum levels and altered HMGB1 expression in patients with psoriasis vulgaris. *Arch Dermatol Res* 2013;305:263-267.

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Cutaneous Implantation Metastasis of Papillary Thyroid Carcinoma Following Fine Needle Aspiration Biopsy

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Dear Editor:

Thyroid carcinoma is the most common endocrine malignancy and the incidence has increased continuously¹. Thyroid fine-needle aspiration biopsy (FNAB) is a reliable, safe, and cost-effective screening test and recommended study for evaluation of thyroid nodules^{2,3}. Post-FNAB local pain and minor hematomas are the most common complications, while serious complications, such as infection, recurrent laryngeal nerve palsy, hemangioma, and tumor implantation seem to be rare³.

A 34-year-old woman presented with an asymptomatic, solitary, bean sized bluish nodule on the right anterior neck for 6 months. Five years ago, thyroid ultrasound ex-

amination revealed a solitary nodule on the right thyroid lobe. Ultrasound-guided FNAB performed on the thyroid nodule and she underwent right lobectomy with regional neck dissection. Pathological findings showed that the tumor was a papillary adenocarcinoma of the thyroid. After surgery, she regularly visited the hospital for follow-up and last visit revealed nonspecific findings.

A subdermal nodule was noted about 3 cm above the operation scar line, at the site where aspiration needle had been inserted (Fig. 1). We removed the nodule with elliptical excision. Pathologic findings showed a well demarcated nodule consisting of many tumor cells with multiple follicular structures. Nuclear features demonstrated apparent ground

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Fig. 1. A solitary bean sized bluish nodule on right anterior neck.

glass, nuclear pseudoinclusions appearing as sharply outlined acidophilic formations, and nuclear grooves (Fig. 2A). In order to identify the tumor origin, immunohistochemical stain with cytokeratin 19, thyroid transcription factor-1 (TTF-1) was positive and thyroglobulin was focal positive (Fig. 2B~D). The nodule was highly suggestive of papillary thyroid carcinoma caused by needle tract dissemination and she was transferred to another hospital for further evaluation.

Implantation metastasis through the needle track is a rare complication of FNAB and the incidence range is between 0.003%~0.009% of all FNABs⁴. Most reported cases are pancreatic, hepatocellular, prostatic cancer or mesothelial cell and melanoma. Several cases of implantation metastasis after FNAB of thyroid carcinoma have also been reported^{4,5}. The interval between FNAB and implantation has been shown to be widely variable, ranges from 1 month to 7 years⁵. The cutaneous implantation doesn't not affect the prognosis of the disease, because it

Fig. 2. Histologic and immunohistochemical study of the biopsy specimen. (A) The tumor cells was monomorphic with ground glass nuclei, nuclear pseudoinclusions and nuclear grooves (H&E, $\times 200$). (B) Immunohistochemical stain for cytokeratin 19 was positive in tumor cells (cytokeratin 19, $\times 200$). (C) Immunohistochemical stain for thyroid transcription factor-1 (TTF-1) was positive in tumor cells and follicles (TTF-1, $\times 200$). (D) Immunohistochemical stain for thyroglobulin was focal positive in tumor cells (thyroglobulin, $\times 200$).

can be surgically removed without recurrence⁵. In order to minimize the risk of skin implantation, it is recommended to use a 23-gauge or smaller needle and to release suction before needle withdrawal^{4,5}.

Although incidence of spontaneous metastasis of thyroid carcinoma is higher than implantation metastasis, we concluded that implantation is more likely for the several reasons in our case: (i) the recurrent tumor occurred at the insertion site of FNAB; (ii) implanted nodule was located above the surgical line; (iii) recurrent tumor was an absence of accompanying lymphoid or neurovascular tissue; and (iv) there was a central bluish papule on the implanted lesion, which suggestive of a previous needle injury^{4,5}.

We describe a case of cutaneous implantation metastasis of the papillary thyroid carcinoma following FNAB. If physicians discover the skin lesion at the site of FNAB during follow up, they must keep in mind the possibility of cutaneous implantation metastasis after FNAB.

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REFERENCES

1. Jung KW, Won YJ, Kong HJ, Oh CM, Lee DH, Lee JS. Cancer statistics in Korea: incidence, mortality, survival, and prevalence in 2011. *Cancer Res Treat* 2014;46:109-123.
2. Lewis CM, Chang KP, Pitman M, Faquin WC, Randolph GW. Thyroid fine-needle aspiration biopsy: variability in reporting. *Thyroid* 2009;19:717-723.
3. Polyzos SA, Anastasilakis AD. Clinical complications following thyroid fine-needle biopsy: a systematic review. *Clin Endocrinol (Oxf)* 2009;71:157-165.
4. Tamiolakis D, Antoniou C, Venizelos J, Lambropoulou M, Alexiadis G, Ekonomou C, et al. Papillary thyroid carcinoma metastasis most probably due to fine needle aspiration biopsy. A case report. *Acta Dermatovenereol Alp Pannonica Adriat* 2006;15:169-172.
5. Polyzos SA, Anastasilakis AD. A systematic review of cases reporting needle tract seeding following thyroid fine needle biopsy. *World J Surg* 2010;34:844-851.

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Fast Cicatrization of Extensive Livedoid Vasculopathy Ulcers under Treatment with Sildenafil

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Dear Editor:

Livedoid vasculopathy (LV) is a microvascular thrombotic skin disease leading to cutaneous infarction and chronic, re-

current painful ulcers¹. Several therapeutic modalities have been used with variable success, but there are no randomized controlled trials attesting the efficacy of any treatment¹.

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