We report here on a case of an epidermal cyst arising in the kidney. This cyst occurred in a 61-year-old woman with a past history of several attacks of ureteral stones and she received treatments of extracorporeal shock wave lithotripsy and open nephrolithostomy. On the intravenous pyelogram, a relatively well demarcated, 5 × 5 cm-sized lesion with calcification was detected in the renal pelvis and calices. The lesion was removed by percutaneous nephrolithostomy. Histologically, the lesion had the same morphologic feature as a typical epidermal cyst arising in the skin. It has been postulated that the intrarenal epidermal cyst arises either from epidermal remnants or it results from traumatic implantation of transformed epithelium. Considering the past history of the patient, it might well be suspected that the present case occurred as a result of traumatic implantation of metaplastic squamous epithelial cells. We report here on a very interesting case of an epidermal cyst in the renal pelvis with a review of the relevant literatures.

Key Words: Epidermal Cyst-Kidney-Renal Pelvis

An epidermal cyst in the skin is a very common lesion but it is very rarely found in the kidney. The epidermal cyst in the kidney was first described by Krogdahl and about 4 cases have been reported in the literature. Like the epidermal cyst in the skin, the epidermal cyst in the kidney is lined by stratified squamous epithelia including granular layers and the cyst is filled with laminated keratins. According to the recent reports, the epidermal cysts can arise in several internal organs such as the kidneys, spinal cord, spleen and testes. What can be the histogenesis of such a cyst arising in kidney? It has been postulated that the intrarenal epidermal cyst arises either from epidermal remnants derived from the Wolffian duct or such a cyst can occur as a result of traumatic implantation of metaplastic squamous epithelium. The distinct histogenesis is, however, unknown.

CASE REPORT

A woman first visited our hospital 18 years ago complaining of several days of right flank pain. Open nephrolithostomy was done to remove multiple stones in the right kidney and ureter. After the open nephrolithostomy, two secessions of extracorporeal shock wave lithotripsy (ESWL) were performed because of ureteral stones at the same site.

She recently revisited our hospital with right flank discomfort she had experienced for 10 months. The physical examination showed no tenderness on the costovertebral angle. Except for microscopic hematuria on urinalysis, the results of the other laboratory studies were within normal limits. Ultrasoundogram and intravenous pyelogram revealed calcified lesions in the right pelvis. The calcified lesions showed a connection with the lower calyx. Since the renal lesion was interpreted as renal stones, right percutaneous nephrolithostomy was performed. During percutaneous nephrolithostomy, calcified materials and laminated pearl-colored materials were removed. After percutaneous nephrolithostomy, the remnants were still seen on the plain film (KUB) (Fig. 1).

The extracted tissue specimens were multiple fragments of soft tissues consisting of whitish laminated amorphous materials (Fig. 2). The largest one of the fragmented tissues measured 4.5 cm in diameter.

The lesion showed the same histologic feature as that of typical epidermal cysts arising in the skin. The wall of the intrarenal cyst was lined by stratified squamous epithelia including granular layers and the cyst was filled with laminated keratin (Fig. 3).
Dystrophic calcifications were present among the laminated keratin (Fig. 4). Skin appendages such as hairs, sebaceous glands, and sweat glands were not seen even with multiple sectioning and close examination of the tissue. Subjacent connective tissues or renal parenchyma were not observed. There was no evidence of cellular atypia or malignancy in the epithelia.

**DISCUSSION**

Epidermal cysts are intradermal or subcutaneous tumors that usually measure less than 5 cm, and they occur most commonly on the face, scalp, neck, and trunk. Most epidermal cysts arising spontaneously in hair-bearing areas result from ectasia of the infundibulum of the hair follicle due to occlusion of the follicular orifices from inflammations or scarring.\(^{10,11}\) Other pathogeneses have been postulated, that the epithelia are folded into the dermis as a result of trauma, which forms true inclusion cysts rather than retention cysts.

The present case showed the histology of a typical epidermal cyst that was lined by stratified squamous cells with granular layers and was filled with laminated keratins. Trichilemmal cysts and dermoid cysts are the main differential diagnostic considerations. In contrast with epidermal cysts, dermoid cysts are composed of skin appendages such as hair follicles and sebaceous glands. The walls of the trichilemmal cysts are filled with homogenous, eosinophilic contents.\(^{10,11}\)

The pathogenesis of the epidermal cysts arising in an internal organs is controversial.\(^{1-9}\) As a possible histogenetic mechanism,
either maldevelopmental (or embryonic) remnants or traumatic implantation of epithelial cells have been proposed. It has been postulated that the intrarenal epidermal cyst in the kidney arises either from epidermal remnants derived from the Wolffian duct or it occurs as a result of traumatic implantation of transformed epithelia. The distinct histogenesis is, however, still unknown.

In the present case, the replacement of urothelia with keratinizing stratified squamous cells might have occurred due to chronic irritations; the patient had endured several attacks of renal stones, ESWLs, and open nephrolithostomy. Furthermore, the lesion was not detected on previous studies. Therefore, it might well be suspected that the present case occurred as a result of traumatic implantation of metaplastic squamous epithelia.

Unfortunately, the diagnosis of the epidermal cyst was not made preoperatively in the present case. Although it is a very rare lesion in the kidney, a calcified epidermal cyst could be considered in the differential diagnosis and further evaluations including a computerized tomogram should be considered when a non-homogenous calcified lesion is detected on plain film. The biological behaviors of intrarenal epidermal cyst is benign rather than aggressive, and complete resection is the choice of treatment.10,11 Because the present case was treated by percutaneous nephrolithostomy, remnants were seen to remain on plain film (KUB). It is possible that the remnants could recur or develop into malignant tumor.12 Therefore, close follow-up is recommended in the present case.

REFERENCES