

## SOFT TISSUE CALCIFICATION IN CHRONIC RENAL FAILURE IN CHILDHOOD\*

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In uremic patients soft tissue calcification may occur in most tissues such as the arteries, joint capsules, periarticular areas, conjunctiva or cornea and internal viscera<sup>1-3</sup>. Soft tissue calcification is a rare complication of renal failure in childhood<sup>2</sup>.

This report presents a uremic child with soft tissue calcification who does not reveal any severe radiological sign of secondary hyperparathyroidism.

### Case Report

An eight-year-old boy was referred to the Hacettepe Children's Hospital with a diagnosis of chronic renal failure. From his history it was learned that he had had edema on his eyelids and feet for several months and that he tired easily. He also complained of a mass on his right wrist which was 3 × 1.5 cm in size and had been painful when he moved his hand during the preceding few weeks.

*Physical examination.* His blood pressure was 170/130 mmHg, height was 118 cm, and weight was 17 kg (both under the third percentile). He had pectus carinatus deformity, mild hepatosplenomegaly and edema on the face and both lower extremities. He also had a tumoral mass on the radial side of his right wrist.

*Laboratory examination.* The hemoglobin was 8.9 g/dl, leukocytes 9400/mm<sup>3</sup>, and the erythrocyte morphology was hypochromic normocytic. Laboratory findings of the serum were as follows: BUN 127 mg/dl, CO<sub>2</sub> content 16 mEq/l, Na 141 mEq/l, K 6.5 mEq/l, Cl 109 mEq/l, Ca 10 mg/dl, P 8 mg/dl, Mg 2.82 mg/dl, alkaline phosphatase 5.4 BU, creatinine 5.6 mg/dl, uric acid 12.4 mg/dl, total lipids 920 mg/dl, cholesterol 230 mg/dl. Urinalysis revealed proteinuria, with a specific gravity of 1012 and pH of 7. The urinary sediment contained many leukocytes, and *Proteus*

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and *Klebsiella* were detected in the urine culture. Endogenous creatinine clearance was 5 ml/min/1.73 m<sup>2</sup>. A plain abdominal x-ray and voiding cystourethrograms were normal. In an IVP the kidneys were not seen. There was some calcification at the radial part of the right wrist (Figure 1). The child was diagnosed as having chronic renal failure and urinary tract infection and was treated by peritoneal dialysis, antihypertensive medicine, and gentamicin. Al(OH)<sub>3</sub> treatment was recommended for the prevention of new soft tissue calcification.



Figure 1

**Calcification at the wrist.**

## Discussion

The two types of calcification described in uremia are metastatic and dystrophic. The former is a reflection of an abnormal chemical milieu resulting in mineral deposition in normal tissues, whereas the latter represents soft tissue mineralization due to local changes in cellular structure<sup>4</sup>. Although the serum calcium  $\times$  phosphate (Ca  $\times$  P) product is high in uremic patients, it is unusual to see macular plaques of calcium salts radiologically<sup>5</sup>.

Tumoral calcifications are multilobular, encapsulated masses containing chalky fluid or pastelike material. They may reach the size of a large orange and are usually painless<sup>6</sup>. Several predisposing factors have been suggested: particularly a Ca  $\times$  P product greater than 70, hypermagnesemia, local tissue injury and alkalosis during dialysis<sup>7</sup>. In this case the Ca  $\times$  P product had increased to 80. This finding suggests that a high Ca  $\times$  P product is a predisposing factor for metastatic calcification and supports Ritz and Bommer's<sup>8</sup> study where the skin and soft tissue calcifications

were related to an increased  $\text{Ca} \times \text{P}$  product. In this case, besides this factor, local tissue injury could also be a predisposing factor because of the vulnerability of the wrist to trauma. So this tumoral mass could be accepted as a dystrophic type of calcification. Soft tissue calcification in uremia is frequently accompanied by severe secondary hyperparathyroidism. However, there were no obvious x-ray findings of severe hyperparathyroidism in our case.

In contrast to adults, vascular and extraosseous tumoral calcifications are virtually never observed in uremic children despite identical serum chemistry<sup>9,10</sup>. The reason for this discrepancy is unknown<sup>11</sup>. Soft tissue calcification is a serious complication at the end stage of renal failure. This particular type of calcification may be life threatening when it involves the conduction system of the heart<sup>4,11</sup>.

## Summary

A uremic child who had a tumoral calcification on the radial side of his right wrist is reported. This case was found interesting because of the absence of secondary hyperparathyroidism on x-ray examination. The etiology of soft tissue calcification in uremic children is discussed.

## REFERENCES

1. Harrison HE, Harrison HC. *Disorders of Calcium and Phosphate Metabolism in Childhood and Adolescence*. Major Problems In Clinical Pediatrics Vol. 20, 1979, p. 291.
2. Hanley DA, Sherwood LM. Secondary hyperparathyroidism in chronic renal failure. Pathophysiology and treatment. *Med Clin North Am* 62: 1319, 1978.
3. Berlyne GM. Microcrystalline conjunctival calcification in renal failure. A useful clinical sign. *Lancet* 2: 366, 1968.
4. Parfitt AM. Soft-tissue calcification in uremia. *Arch Intern Med* 124: 544, 1969.
5. Massry SG, Coburn JW, Popoutzer MM, et al. Secondary hyperparathyroidism in chronic renal failure. The clinical spectrum in uremia during hemodialysis and after renal transplantation. *Arch Int Med* 124: 1, 1972.
6. Massry SG. Renal osteodystrophy pathogenesis, clinical features and treatment. *Kidney* 5: 1, 1972.
7. Kuzela DC, Hufer WE, Conger JD, et al. Soft tissue calcification in chronic dialysis patients. *Amer J Path* 96: 408, 1977.
8. Ritz EM, Bommer J. Metabolic bone disease in patients on maintenance hemodialysis. *Nephron* 12: 393, 1972.
9. Potter DE, Wilson CJ, Ozonoff MB. Hyperparathyroid bone disease in children undergoing longterm hemodialysis treatment with vitamin D. *J. Pediatr* 85: 60, 1974.
10. Terman BS, Alfrey AC, Hammond WS. Cardiac calcification in uremia. *Amer J Med* 50: 744, 1971.
11. Ritz EM, Bommer J, Schmit GH, et al. Vascular calcifications under maintenance hemodialysis. *Klin Wochenschr* 55: 385, 1977.