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# Treatment of calcinosis cutis by extracorporeal shock-wave lithotripsy

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**Background:** Calcinosis cutis (CC) encompasses debilitating complications of connective tissue disorders and chronic venous insufficiency. Extracorporeal shock-wave lithotripsy (ESWL) is an effective treatment for urolithiasis, pancreatolithiasis, and calcified tendinitis. This study prospectively evaluated ESWL efficacy and tolerance for patients with CC.

**Methods:** This monocentric prospective study included all consecutive patients with CC progressing for at least 3 months, while their underlying causal disease was not. They underwent 3 ESWL sessions at 3-week intervals. The CC area and associated pain (visual analog scale score and analgesic consumption) were recorded before and 6 months after ESWL.

**Results:** Eight patients were included: 4 with chronic venous insufficiency, 3 with systemic sclerosis, and one with dermatomyositis. ESWL was used to treat 10 CC lesions. Seven patients completed 3 ESWL sessions. Six months after ESWL, the median CC area had decreased from 3.1 to 1.9 cm<sup>2</sup>. Visual analog scale—assessed pain scores declined dramatically, from 7 to 2 of 10, as did analgesic consumption, without any difference according to the causal disease.

**Limitations:** Only 8 consecutive patients have been included and treated by ESWL during our study.

**Conclusion:** This evaluation of ESWL efficacy and tolerance for the treatment of CC found no difference between the different underlying CC causal diseases in terms of efficacy. Based on our observations, ESWL efficacy was better against small, ulcerated, and radiopaque CC, and it had an analgesic effect that might make subsequent surgical excision of CC fragments easier. Ergonomic adaptations are required to facilitate and expand ESWL use in dermatology. (J Am Acad Dermatol 2012;66:424-9.)

**Key words:** calcinosis cutis; chronic venous insufficiency; dermatomyositis; extracorporeal shock-wave lithotripsy; systemic sclerosis; treatment.

Calcinosis cutis (CC) represents a frequently debilitating complication of chronic venous insufficiency (CVI) and some connective tissue diseases (eg, systemic sclerosis [SSC], dermatomyositis) that usually arises subsequent to hydroxyapatite crystal deposition in the dermis and hypodermis.<sup>1</sup> These lesions can be the origin of

#### Abbreviations used:

CC:	calcinosis cutis
CVI:	chronic venous insufficiency
ESWL:	extracorporeal shock-wave lithotripsy
SSC:	systemic sclerosis
VAS:	visual analog scale

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chronic ulcerations and/or infections, and can have major functional impact because of associated pain. CC physiopathogenesis is poorly understood and its treatment is not standardized.<sup>1,2</sup> Moreover, medical treatments have been disappointing. Surgical CC excision is sometimes difficult because of the topography of the lesions or the underlying causal disease, notably SSC.<sup>1</sup>

Extracorporeal shock-wave lithotripsy (ESWL), a technique that destroys calcifications by acoustic

shock waves, has been used routinely for many years to eliminate kidney stones.<sup>3</sup> Its application in rheumatology to treat calcified tendinitis is a more recent development.<sup>4-7</sup> In dermatology, isolated cases reports have suggested ESWL efficacy in treating CC.<sup>8,9</sup> Our objective was to prospectively evaluate the efficacy and tolerance of ESWL to treat CC.

## METHODS

This prospective mono-center feasibility study was conducted from March 2008 to December 2009 in our dermatology department. Inclusion criteria were one or several CC present for at least 3 months in patients older than 18 years, secondary to nonprogressive CVI, SSC, or dermatomyositis. Patients with a contraindication to ESWL (eg, pregnancy, pacemaker, osteosynthesis in proximity to the calcification, coagulopathy) were excluded, as were those with factors maintaining CC, for example, chronic renal insufficiency (creatinine clearance < 60 mL/min) or abnormal phosphocalcic metabolism. Patients were included consecutively after giving their written consent after an explanation of the treatment modalities and follow-up.

Information was recorded on a standardized form. At inclusion, the clinical data collected by the same physician (N. S-B.) were: age; sex; medical history; underlying causal disease and its duration; and the number of CC, their topography, duration, and area (calculated as the product of their two largest diameters determined by palpation [cm<sup>2</sup>]). Local CC-induced pain was systematically evaluated with a visual analog scale (VAS) (scored 1-10) and analgesia consumption (according to the therapeutic levels 1-3 of the agents prescribed, defined by the World Health Organization) during the 7 days before inclusion. CC were photographed at inclusion.

Complementary examinations included laboratory analyses (complete blood cell count, ionogram, creatinemia, transaminases, calcemia, phosphatemia, erythrocyte sedimentation rate, C-reactive protein, serum protein electrophoresis, urinary dipstick) and standard radiographs (face and profile) of the CC.

All the ESWL sessions were conducted in the urology department by the same operator (J. M.), who used an electroconductive lithotripter (2005 Sonolith Vision, EDAP-Technomed, Vaulx-en-Velin,

France) (Fig 1). Patients systematically received paracetamol (1 g) as premedication. We applied the acoustic intensity used by rheumatologists to treat calcified tendinitis of the rotator cuff,<sup>4-7</sup> delivering 2500 shock waves of 0.3 mJ/mm<sup>2</sup>/CC during each of the 3 sessions, scheduled at 3-week intervals. The patients had to lie down on a table. The CC were

located fluoroscopically by means of a brilliance amplifier coupled to the lithotripter. Treatment lasted between 15 and 20 minutes for each CC. After the ESWL session, patients were taken back to their ward for post-ESWL checks and search for immediate and short-term side effects, before leaving the hospital (average time <2 hours).

Clinical follow-up was scheduled 3 and 6 months after the third ESWL session. CC area was measured clinically and radiologically at each follow-up consultation,

as was pain assessment (VAS score and analgesia used during the preceding 7 days). Tolerance and potential side effects linked to ESWL were recorded at each visit.

## RESULTS

Eight patients (7 women and one man; median age 80 [range 19-91] years) were included: 4 had CVI, 3 SSC, and one amyopathic dermatomyositis (Table I). Previous treatments (mechanical extraction, dressings) of these CC had been totally ineffective. The 4 patients with CVI had all undergone vascular surgery (venous stripping, stripping ligation, or phlebectomy) and two of them had strict contraindications for further surgery. Treatments of the underlying causal diseases had not been modified during the study or the 6 months before or after it. The median time to diagnosis of the causal disease was 20 (range 5-50) years, the median time of CC progression was 4 (range 2-30) years, and the median CC area before ESWL was 3.1 (range 0.5-40) cm<sup>2</sup>. During the 7 days before the first ESWL session, the median VAS pain score was 7 of 10 (range 0-9/10) and 4 patients were taking analgesics (two level 2 and two level 3). A total of 10 CC were subjected to ESWL; two patients had two CC at different sites.

Seven of the 8 patients were seen at 6 months; an 83-year-old woman with SSC and a history of recurrent intestinal diverticulosis died of intestinal occlusion 1 week after the first ESWL session.

## CAPSULE SUMMARY

- The use of extracorporeal shock-wave lithotripsy to treat calcinosis cutis was evaluated.
- Extracorporeal shock-wave lithotripsy appeared well tolerated and efficient against pain whereas the area diminution was more modest.
- No difference was found between the different underlying calcinosis cutis causal diseases in terms of extracorporeal shock-wave lithotripsy efficacy.

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