

Calcinosis preferentially affects the thumb compared to other fingers in patients with systemic sclerosis

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Background

- Systemic sclerosis (SSc)-related calcinosis (which is well demonstrated on plain X-rays), frequently affects the fingers, and can be a major source of pain and disability.
- Although Raynaud's phenomenon often spares the thumb, clinical experience suggests that conversely the thumb is frequently affected by calcinosis. (Figure 1)



Figure 1: Calcinosis on the thumb

Aims

- To investigate the hypothesis that in patients with SSc, thumbs are more commonly affected than other digits by calcinosis.
- Specific objectives were to:
 - Review the radiographs of patients with SSc and calcinosis and give each finger a score according to the severity of calcinosis.
 - Describe any significant differences in the scores between the thumbs and other fingers.

Patients and Methods

- Hand radiographs from patients with SSc from a single tertiary referral centre were selected for analysis on the basis that at least one area of calcinosis was identified. (Figure 2)

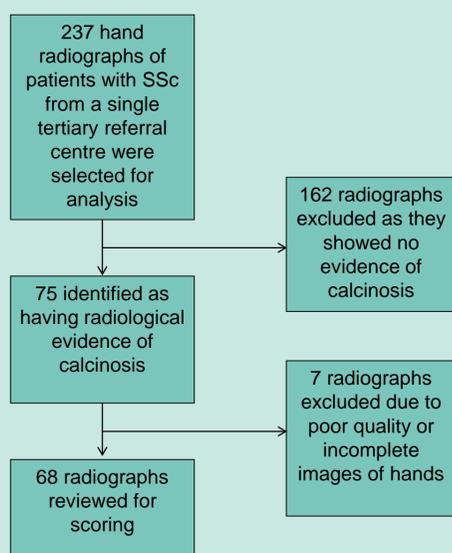


Figure 2: Diagram showing the method of selection of included radiographs

- Each finger on both hands of each patient was assigned a severity score on a 0 to 3 scale (0 = no calcinosis, 3 = most severe): scores were then analysed. The scoring was completed twice, including and excluding the metacarpals.

- Examples of scoring are shown in Figure 3.
- Each finger was assigned a title as follows:

L1- left thumb	R1- right thumb
L2- left index finger	R2- right index finger
L3- left middle finger	R3- right middle finger
L4- left ring finger	R4- right ring finger
L5- left little finger	R5- right little finger



Figure 3: Radiographic images showing examples of scores. From left to right, 0=no calcinosis, 1=mild, 2=moderate, 3=severe.

Figure 4: Radiographic image showing example of calcinosis.

L1a- 1	R1a- 2	L1b- 1	R1b- 2
L2a- 0	R2a- 2	L2b- 0	R2b- 2
L3a- 0	R3a- 0	L3b- 0	R3b- 0
L4a- 0	R4a- 1	L4b- 0	R4b- 1
L5a- 0	R5a- 0	L5b- 0	R5b- 2

Results

- Hand X-rays of 68 patients with SSc showed calcinosis
 - 90% female,
 - median age 62 years [range 55-68],
 - 81% limited cutaneous and 19% diffuse cutaneous
- Results are shown in Figures 5-8.
- When metacarpals were excluded, the overall trend in scores across digits for both hands suggested that there was decreasing severity from the thumb to the little finger.
- There were a particularly large number of 3 scores for thumbs on right hands (15%) compared to left hands (4%).
- A Friedman test of difference in median scores across fingers (testing for an overall difference between fingers) was statistically significant for both left hands and right hands (both $p < 0.0001$).

- Post-hoc tests of the difference in paired medians between thumbs and other fingers showed, for left hands, significant differences in severity between the thumb and fingers 3, 4 and 5 and for right hands, significant differences between the thumb and each of the other fingers.
- For example, for right hands the median difference in calcinosis scores between the thumb and finger 5 was 1.5 (95% confidence interval [CI] 1.0 to 2.0, $P < 0.0001$), and between the thumb and finger 2 the median difference was 0.5 (95% CI 0.0 to 1.5, $P = 0.037$). When the analysis was repeated for scores including the metacarpals, the same broad trends were apparent.

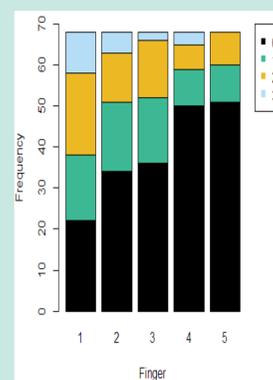


Figure 5: Distribution of scores of left digits, excluding metacarpals

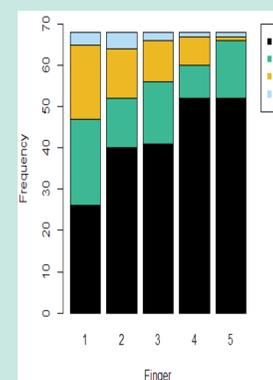


Figure 6: Distribution of scores of right digits, excluding metacarpals

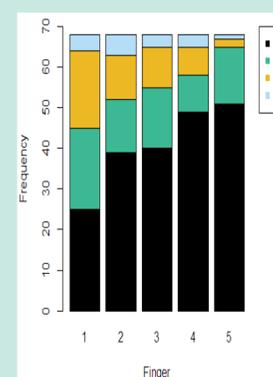


Figure 7: Distribution of scores of left digits, including metacarpals

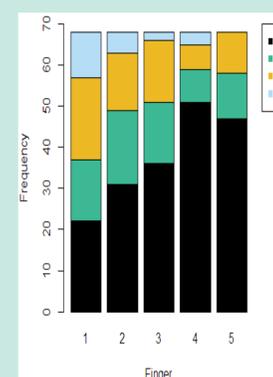


Figure 8: Distribution of scores of right digits, including metacarpals

Conclusion

- The thumb is affected by calcinosis more than other digits, followed by the index finger.
- This observation provides insight into the pathogenesis of SSc-related calcinosis, which may relate more to repetitive trauma than to ischaemia