Supplemental Table 1. Specimens and patient data.

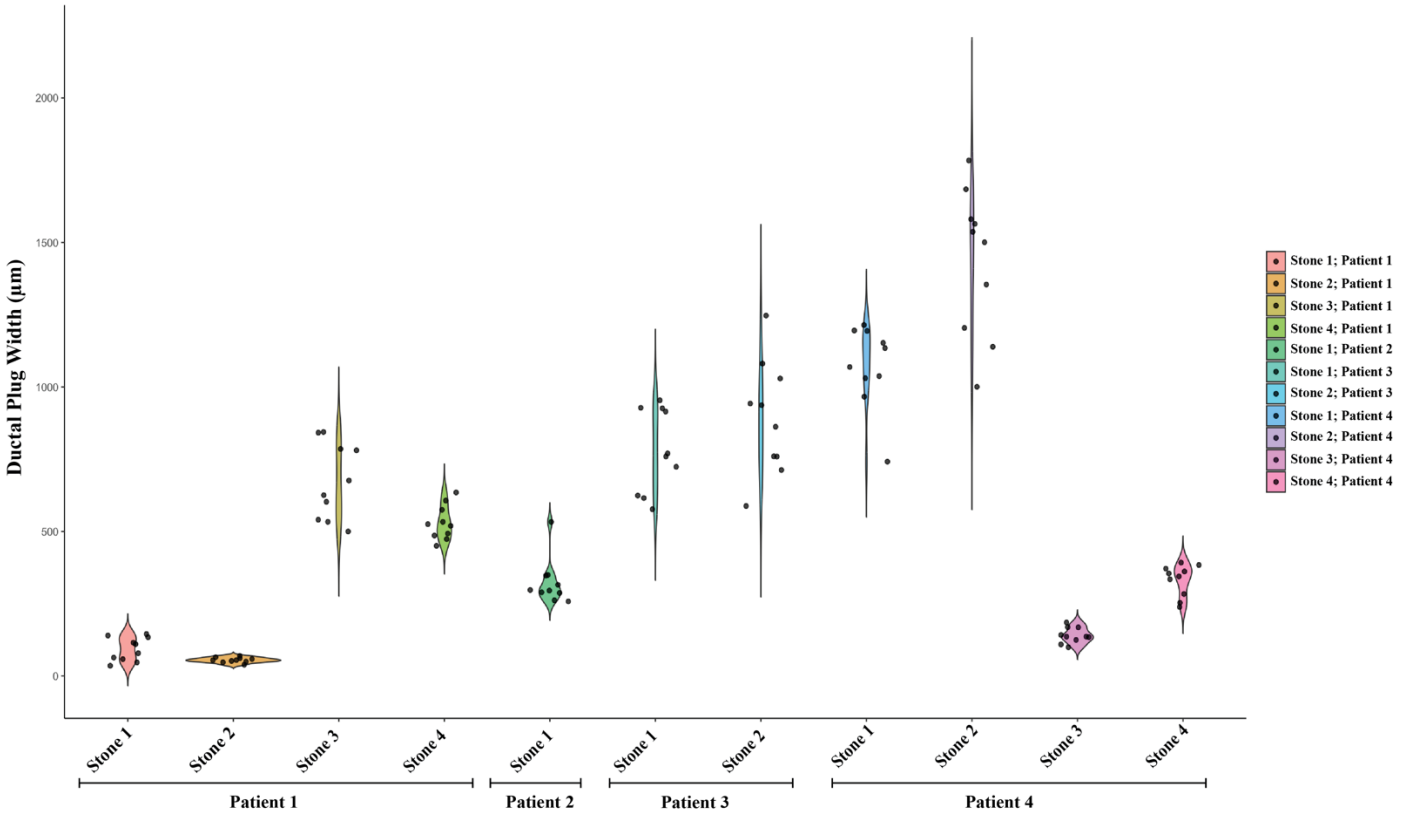
Supplemental Table 1

Clinical and surgical data on patients with ductal plug stones

	Patient 1	Patient 2	Patient 3	Patient 4
# Ductal plug stones	4	2	2	4
Age	41	38	44	55
Sex	F	F	F	F
Body mass index	29.8	19.63	35.82	32
Age at first stone	17	32	39	—
Hypertension	No	No	No	—
Diabetes	No	No	No	—
Surgery	URS	URS	Perc	URS
Serum creatinine (mg/dL)	0.48	0.98	0.73	1.04
Serum calcium (mg/dL)	10.3	9.2	10.1	10.1
Serum uric acid (mg/dL)	3.2	—	6.5	—
24-hour urine volume (L)	—	3.5	1.45	1.6
24-hour urine pH	—	6.63	5.9	5.9
24-hour urine citrate (mg)	—	736	480	23
24-hour urine calcium (mg)	—	262	360	219
24-hour urine oxalate (mg)	—	25	35	25
24-hour urine sodium (mEq)	—	77	184	101
24-hour urine CaOx supersaturation	—	3.01	13.16	9.4
24-hour urine CaP supersaturation	—	1.32	1.65	0.6

URS, ureteroscopy. Perc, percutaneous nephrolithotomy, or Both, both ureteroscopy and percutaneous nephrolithotomy.

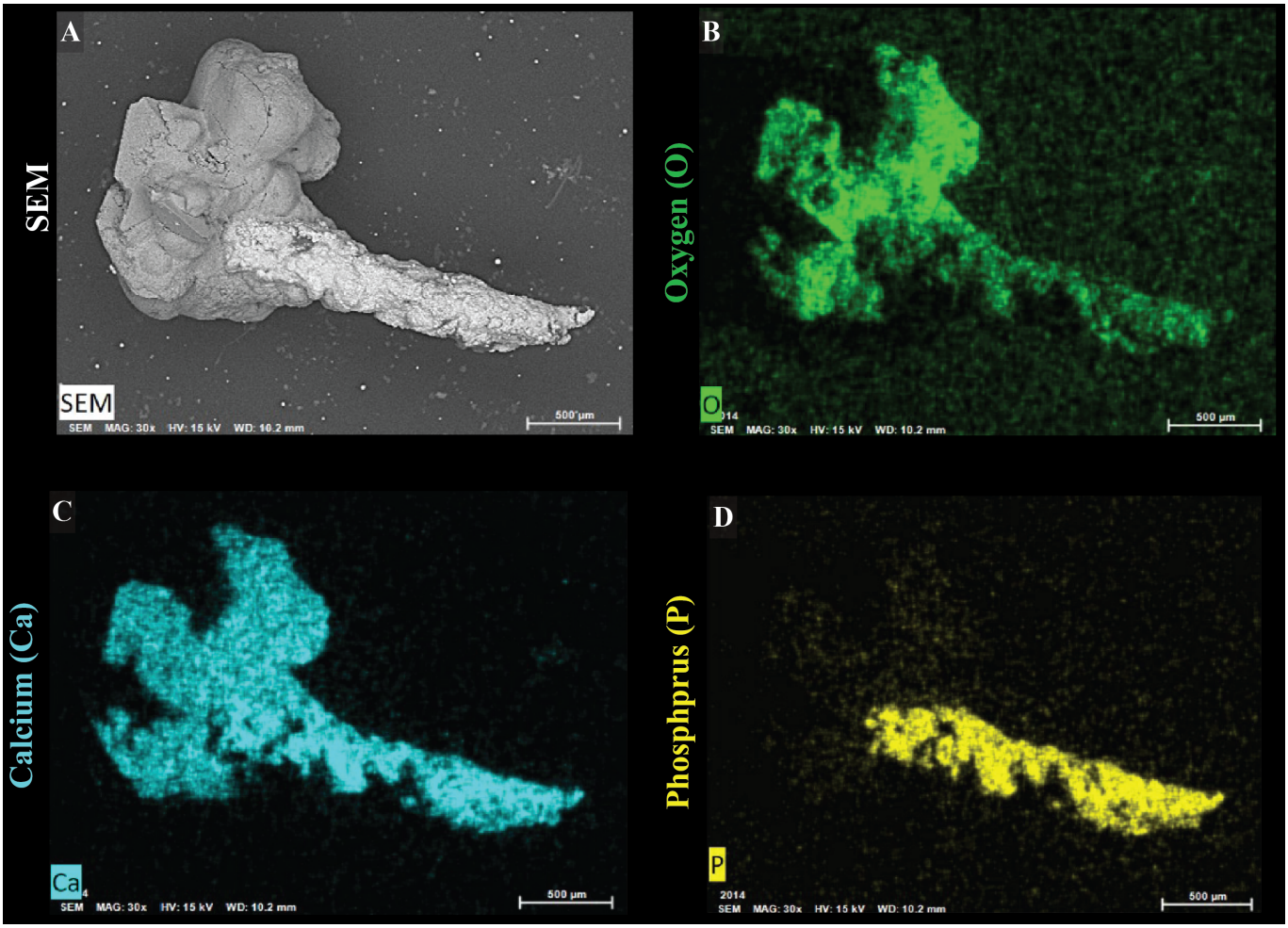
Supplemental Table 2



Supplemental Table 2. Ductal plug width measurements (µm) from micro CT analysis.

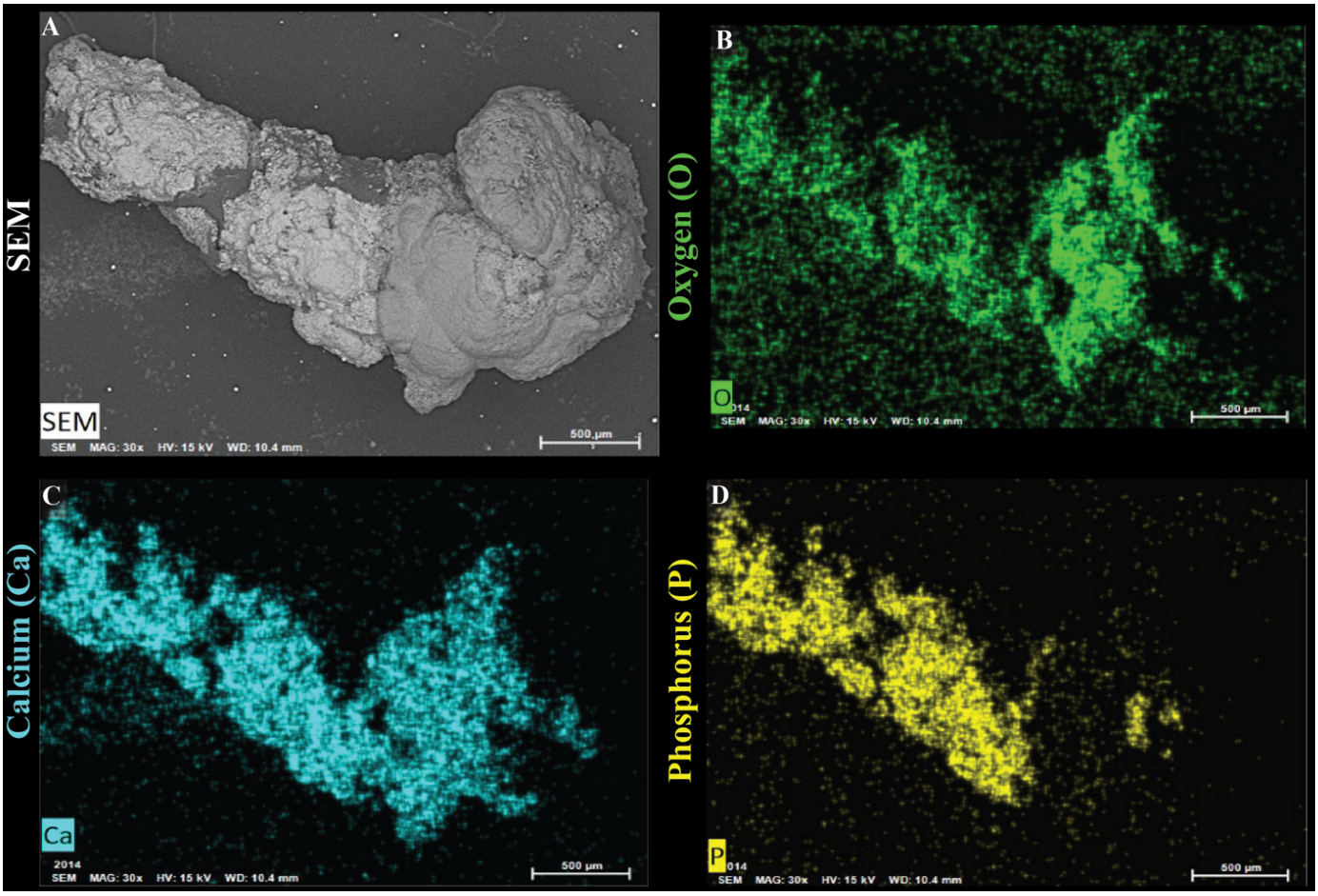
Individual ductal plug width measurements (µm) obtained from micro CT virtual slice analysis.

Supplemental Figure S1



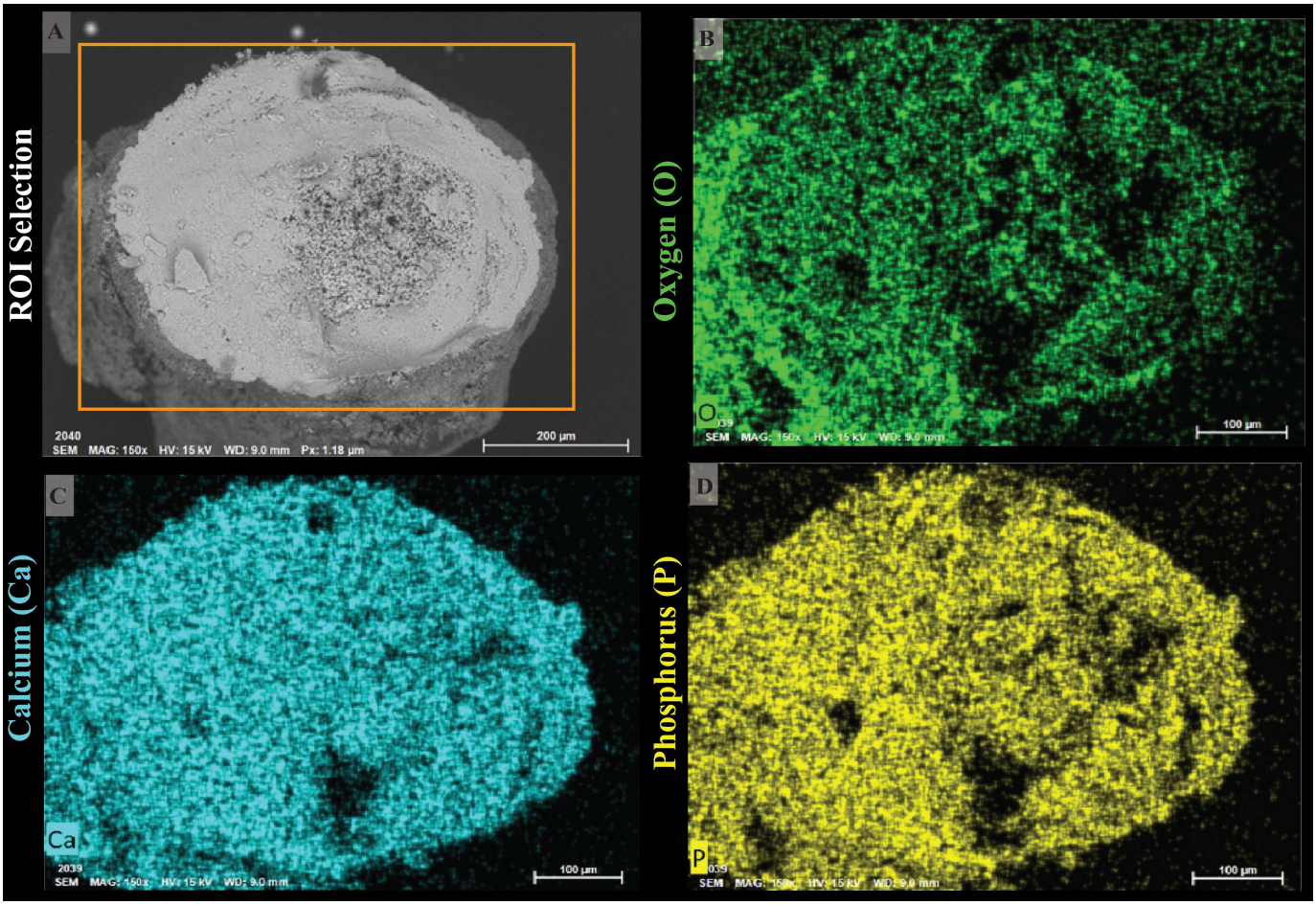
Supplemental Figure S1. Energy dispersive spectroscopy (EDS) analysis of ductal stone #4 from Patient 4 (referenced in main Figure 1) confirms the presence of calcium phosphate (CaP) apatite crystals in the plug portion. (A) SEM image highlighting the analyzed ductal plug stone from Patient 4, stone #4. **(B)** Distribution of oxygen (O) atoms throughout the stone and plug. **(C)** Detection of calcium (Ca) atoms across throughout the stone, including in the overgrowth areas of calcium oxalate monohydrate (COM) and calcium oxalate dihydrate (COD). **(D)** A long region positive for both calcium (Ca) and phosphorus (P) atoms, indicating the presence of CaP apatite crystals within the plug region.

Supplementary Figure S2



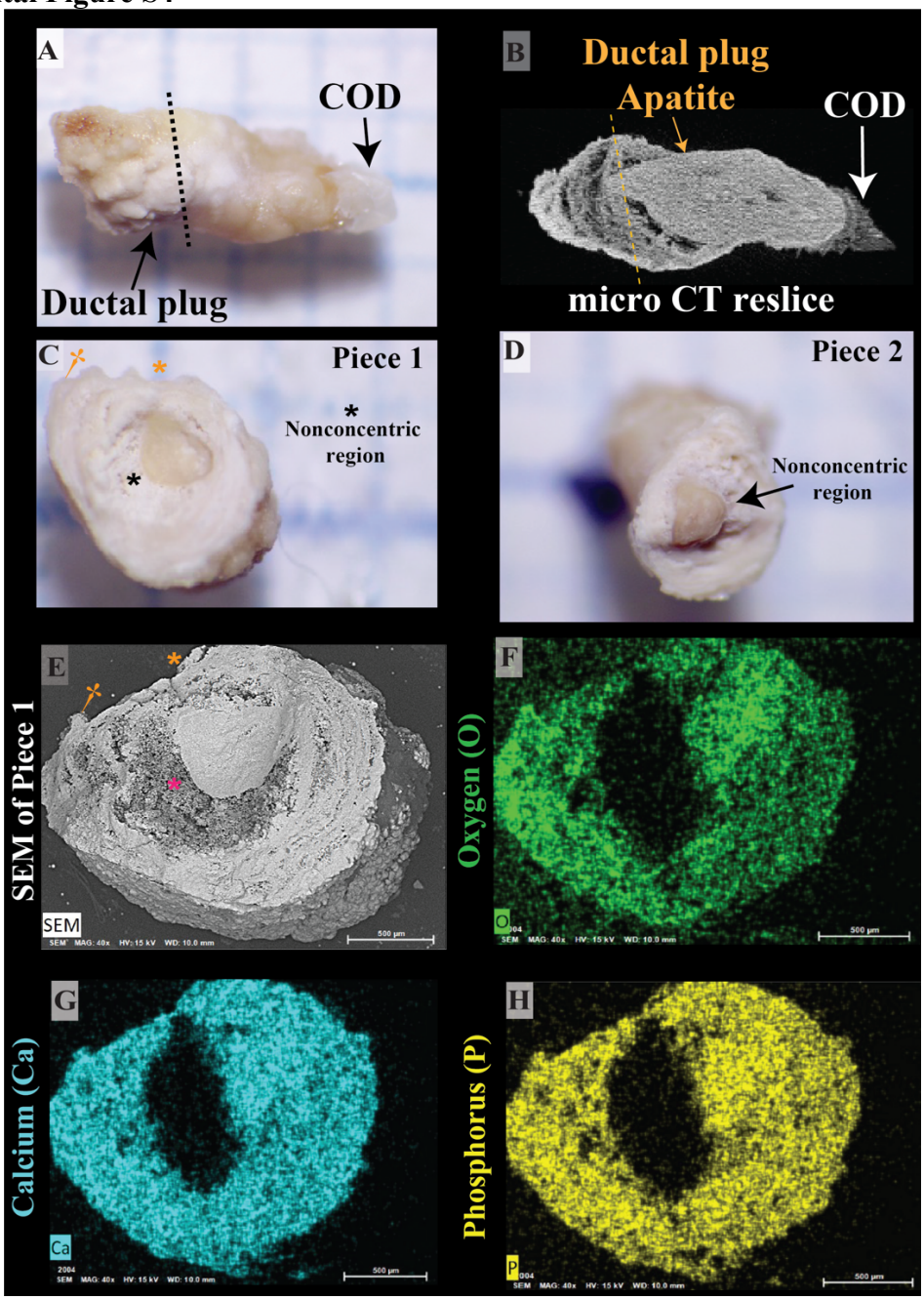
Supplementary Figure S2. Energy dispersive spectroscopy (EDS) analysis of ductal stone #1 from Patient 3 (referenced in main Figures 2 and 3) confirms the presence of calcium phosphate (CaP) apatite crystals in the plug portion. (A) SEM image highlighting the analyzed ductal plug stone from Patient 3, stone #1. **(B)** Distribution of oxygen (O) atoms throughout the stone and plug. **(C)** Detection of calcium (Ca) atoms across throughout the stone, including in the overgrowth areas of calcium oxalate monohydrate (COM) and calcium oxalate dihydrate (COD). A shadow casts blocks some of the COM due to sample positioning. **(D)** A long region positive for both calcium (Ca) and phosphorus (P) atoms, indicating the presence of CaP apatite crystals within the plug region.

Supplementary Figure S3



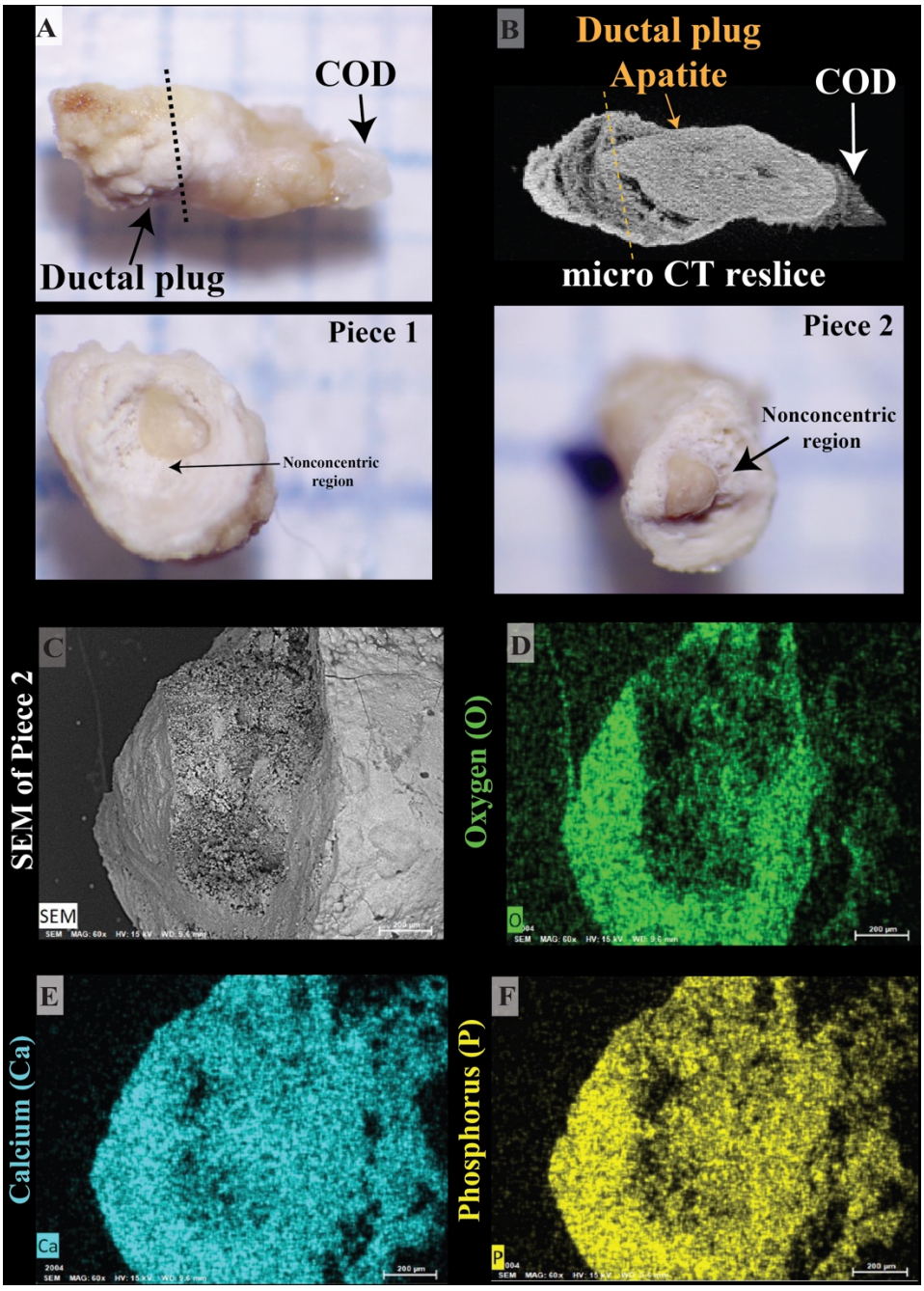
Supplementary Figure S3. EDS analysis. Energy dispersive spectroscopy (EDS) analysis of ductal stone #1 from Patient 4 (referenced in main Figure 4) confirms the presence of calcium phosphate (CaP) apatite crystals in the sectioned plug portion. (A) SEM image highlighting the analyzed ductal plug stone from Patient 4, stone #1. **(B)** Distribution of oxygen (O) atoms throughout the stone and plug. **(C)** Detection of calcium (Ca) atoms throughout the plug. **(D)** Detection of phosphorus (P) atoms, indicating the presence of CaP apatite crystals within the plug region.

Supplemental Figure S4



Supplemental Figure S4. Sectioning of the ductal plug stone shown in main Figure 5. Scanning electron microscopy (SEM) and Energy dispersive spectroscopy (EDS) analysis of piece 1 from ductal stone #2 from Patient 4 confirms the presence of calcium phosphate (CaP) apatite crystals in the sectioned plug portion.

Supplemental Figure S5



Supplemental Figure S5. Sectioning of the ductal plug stone shown in main Figure 5. Scanning electron microscopy (SEM) and Energy dispersive spectroscopy (EDS) analysis of piece 2 from ductal stone #2 from Patient 4 confirms the presence of calcium phosphate (CaP) apatite crystals in the sectioned plug portion.