

Supplement Table 1: Treatment regimen for patients with leprosy

Patient No	Treatment plan*	Treatment period	Adjuvant Treatment
1	MDT-MB	2019.3.7-2020.3.13	None
2	MDT-MB	2018.10.12-2019.11.19	Prednisone is administered orally with a tapering dosage, starting at 8 tablets per day in the first month, reduced to 6 tablets per day in the second month, 4 tablets per day in the third month, and so on, until reaching 1 tablet per day (8-6-4-3-2-1 [#]).
3	MDT-MB	2018.11.12-2019.11.8	Prednisone is administered orally with a tapering dosage, starting at 8 tablets per day in the first month, reduced to 6 tablets per day in the second month, 4 tablets per day in the third month, and so on, until reaching 1 tablet per day (8-6-4-3-2-1 [#]).
4	MDT-MB	2019.2.13-2020.3.4	<input type="checkbox"/> type leprosy reaction; thalidomide 100 mg/qd for 4 months
5	MDT-MB	2019.2.28-2020.2.4	1.MDT-MB (On February 1, 2019, the report from Shandong Provincial Dermatology Hospital indicated a positive DDS test, thus an alternative therapy was prescribed, including rifampin capsules and clofazimine for one year.)
6	MDT-MB	2019.3.1-2022.12.1	
7	MDT-MB	2019.3.14-2021.10.18	Prednisone is administered orally with a tapering dosage, starting at 8 tablets per day in the first month, reduced to 6 tablets per day in the second month, 4 tablets per day in the third month, and so on, until reaching 1 tablet per day (8-6-4-3-2-1 [#]).
8	MDT-MB	2019.04.17-2020.5.29	None
9	MDT-MB	2019.4.18-2020.4.26	None

*The treatment regimen for leprosy involves a combination of physician-supervised oral medication (WHO-MB) and patient self-administration as following, ensuring the necessary intake of rifampicin. WHO-MB: administered under medical supervision with rifampicin (RFP) 600 mg/month, dapsone (DDS) 100 mg/month, clofazimine (B663) 300 mg/month; Self-administered by the patient: dapsone (DDS) 100 mg/day, clofazimine (B663) 50 mg/day.

[#]8-6-4-3-2-1:

The oral prednisone dosage is gradually tapered: starting with 8 tablets daily in the first month, reduced to 6 tablets daily in the second month, 4 tablets daily in the third month, and so on, until 1 tablet daily in the fifth month (8-6-4-3-2-1). This indicates the frequency of dose reduction.

MDT: multidrug therapy; PO: oral administration.

Supplementary Table 2: Normal nerve cross-sectional area reference data (unit mm²)

Normal nerve cross-sectional area reference data (unit mm ²)											
Ulnar nerve		Median nerve		Radial nerve		Sciatic nerve		Tibial		Common peroneal nerve	
Left	Right	Left	Right	Left	Right	Left	Right	Left	Right	Left	Right
6.75 ± 1.67	6.80 ± 1.65	7.45 ± 1.91	7.31±1.95	6.08±1.45	6.10±1.44	50.01±10.46	56.12±10.22	43.21±7.69	42.11±7.56	13.92±4.22	14.13±4.53

Supplementary Table 3 Considering the duration, the estimated (beta) and p-values of the radiomic features of nerves were calculated by the LLM.

Nerve detected site	Intensity characteristics						morphological characteristics						Solidity	P-value	
	Hmean	P-value	Hskew	P- value	kurtV	P-value	AreaOri	P-value	Meanvthk	P-value	Meanvlong	P- value			
LM1	Beta	0.0073	0.004	-0.0568	0.006	-0.2326	0.003	-0.0144	0.069	-0.0049	0.021	0.0033	0.865	-0.0055	0.069
RM1		0.0068	0.002	-0.0461	0.014	-0.1836	0.006	0.0002	0.968	-0.0007	0.732	0.0287	0.129	-0.0008	0.776
LM2	Beta	0.0049	0.029	-0.0280	0.022	-0.0781	0.015	0.0003	0.951	0.0002	0.874	-0.0271	0.082	0.0009	0.505
RM2		0.0047	0.077	-0.0308	0.040	-0.0943	0.031	0.0069	0.320	0.0021	0.296	0.0015	0.922	0.0012	0.338
LM3	Beta	0.0025	0.292	-0.0194	0.319	-0.0309	0.554	0.0001	0.993	0.0003	0.844	-0.0141	0.560	-0.0037	0.343
RM3		0.0056	0.006	-0.0239	0.088	-0.0557	0.099	0.0041	0.473	0.0003	0.838	0.0323	0.144	-0.0001	0.967
LM4	Beta	0.0044	0.044	-0.0282	0.054	-0.0844	0.030	0.0031	0.587	0.0011	0.471	0.0170	0.410	0.0001	0.956
RM4		0.0041	0.074	-0.0276	0.091	-0.0717	0.116	-0.0011	0.840	-0.0001	0.923	-0.0251	0.121	-0.0008	0.652
LU1	Beta	0.0101	<.0001	-0.0543	0	-0.1252	0.001	0.0025	0.632	-0.0004	0.750	0.0578	0.002	-0.0005	0.830
RU1		0.0082	0.006	-0.0448	0.017	-0.1370	0.008	-0.0047	0.573	-0.0024	0.281	0.0095	0.537	0.0005	0.876
LU2	Beta	0.0076	0.001	-0.0416	0.003	-0.0988	0.002	-0.0097	0.132	-0.0033	0.073	-0.0251	0.232	-0.0029	0.409
RU2		0.0105	<.0001	-0.0567	<.0001	-0.1255	<.0001	-0.0094	0.165	-0.0030	0.136	-0.0257	0.126	-0.0007	0.742
LU3	Beta	0.0055	0.019	-0.0368	0.033	-0.1570	0.013	-0.0143	0.186	-0.0062	0.025	0.0035	0.822	-0.0048	0.241
RU3		0.0052	0.032	-0.0345	0.023	-0.1433	0.013	-0.0068	0.367	-0.0031	0.134	-0.0062	0.673	-0.0043	0.321
LU4	Beta	0.0040	0.249	-0.0342	0.133	-0.1250	0.114	-0.0012	0.951	-0.0009	0.873	-0.0384	0.177	-0.0004	0.899
RU4		0.0077	0.002	-0.0438	0.010	-0.1623	0.003	-0.0112	0.109	-0.0035	0.085	0.0057	0.780	-0.0023	0.218
LU+	Beta	0.0039	0.473	-0.0313	0.334	-0.1262	0.176	-0.0137	0.213	-0.0041	0.203	0.0131	0.630	-0.0055	0.040

RU+		0.0082	0.025	-0.0502	0.030	-0.1986	0.010	-0.0221	0.010	-0.0066	0.009	-0.0243	0.323	-0.0004	0.904
LR2	Beta	0.0063	0.067	-0.0316	0.083	-0.0742	0.023	0.0016	0.762	0.0004	0.755	-0.0066	0.693	0.0032	0.533
RR2		0.0050	0.092	-0.0174	0.268	0.0030	0.868	0.0006	0.888	0.0004	0.729	-0.0154	0.533	0.0015	0.604
LR3	Beta	0.0041	0.061	-0.019	0.234	-0.0381	0.393	0.0036	0.474	0.0002	0.894	0.0083	0.660	0.0012	0.616
RR3		0.0025	0.323	-0.0141	0.347	-0.0493	0.137	0.0016	0.739	-0.0002	0.862	-0.0159	0.404	0.0002	0.923
LT2	Beta	0.0058	0.014	-0.0355	0.020	-0.1244	0.010	-0.0156	0.096	-0.0049	0.071	0.0079	0.566	-0.0000	0.990
RT2		0.0078	0.002	-0.0426	0.009	-0.1480	0.003	-0.0020	0.753	-0.0005	0.747	0.0162	0.306	0.0038	0.131
LT3	Beta	0	0.997	0.0070	0.770	0.0221	0.801	0.0115	0.259	0.0046	0.094	-0.0138	0.281	0.0014	0.583
RT3		0	0.990	0.0086	0.031	0.0310	0.705	-0.0123	0.044	-0.0019	0.197	-0.0229	0.207	-0.0039	0.109
LT4	Beta	0.0081	0.009	-0.0588	0.014	-0.2194	0.013	0.0040	0.691	0.0003	0.914	0.0149	0.371	0.0022	0.355
RT4		0.0062	0.010	-0.0389	0.034	-0.1363	0.032	0.0067	0.554	0.0006	0.843	0.0044	0.790	0.0027	0.299
LCF1- LT1	Beta	0.0014	0.550	-0.0094	0.583	-0.0470	0.451	-0.0035	0.821	-0.0008	0.870	0.0084	0.591	-0.0005	0.792
RCF1- RT1		0.0102	<.0001	-0.0601	0.001	-0.2040	0.001	-0.0123	0.332	-0.0039	0.289	0.0409	0.009	0.0004	0.808
LCF2	Beta	0.0061	0.011	-0.0338	0.031	-0.1102	0.009	0.0006	0.934	-0.0003	0.874	0.0164	0.109	0.0036	0.191
RCF2		0.0055	0.062	-0.0311	0.096	-0.1000	0.076	-0.0035	0.689	-0.0014	0.604	-0.0088	0.267	-0.0007	0.833
LCF3	Beta	0.0068	0.030	-0.0366	0.042	-0.1080	0.024	-0.0029	0.779	-0.0007	0.811	0.0071	0.730	0.0027	0.552
RCF3		0.0062	0.022	-0.0340	0.061	-0.1056	0.070	-0.0007	0.950	-0.0011	0.719	0.0151	0.361	-0.0003	0.927

P-values were determined using the LMM.

L: left. R: right.

Beta represents the estimated values of the fixed effects, indicating the strength and direction of the influence of independent variables on the dependent variable.

Nerves were examined at several locations. The median nerve was assessed in the carpal tunnel (M1), 10 cm above the carpal tunnel (M2), at the cubital fossa (M3), and 10 cm above the cubital fossa (M4). The radial nerve was assessed 3 cm above the cubital fossa (R2) and in the radial groove (R3). The ulnar nerve was assessed at the carpal striation (U1), 10 cm above the carpal transverse crease (U2), at the olecranon (U3), and 2 cm and 10 cm above the olecranon (U+/U4). The tibial nerve was assessed at the popliteal nerve bifurcation (T2), 5 cm below the popliteal fossa (T3), and at the medial malleolus (T4). The common peroneal-tibial nerve was

assessed 5 cm above the popliteal fossa (CF1-T1). The common peroneal nerve was assessed at the bifurcation of the popliteal fossa (CF2) and at the fibular head (CF3).

Supplementary Table 4 Considering the duration, the estimates and p-values of the neuroradiological characteristics of type 1 leprosy reactions compared with the no leprosy reaction group.

	Intensity characteristics						Morphological characteristics							
	Hmean	P-value	Hskew	P-value	kurtV	P-value	AreaOri	P-value	Meanvthk	P-value	Meanvlong	P-value	Solidity	P-value
LM1	-0.0420	0.053	0.3120	0.075	1.5941	0.015	0.3054	<.0001	0.0793	<.0001	0.0326	0.858	0.0327	0.196
RM1	-0.0279	0.162	0.1629	0.351	0.8542	0.165	0.1873	0.003	0.0550	0.004	0.3133	0.078	0.0279	0.290
LM2	-0.0023	0.912	-0.0413	0.718	-0.1480	0.618	0.1170	0.003	0.0333	0.004	0.3892	0.006	0.0255	0.043
RM2	-0.0420	0.087	0.1367	0.326	0.4146	0.301	0.1455	0.011	0.0395	0.018	0.1166	0.429	0.0156	0.191
LM3	-0.0295	0.187	0.0581	0.748	0.2050	0.676	0.2050	0.676	-0.0028	0.842	0.2401	0.289	-0.053	0.142
RM3	-0.006	0.753	-0.0813	0.542	-0.0714	0.822	-0.0714	0.822	0.0154	0.236	0.0316	0.881	0.0364	0.257
LM4	-0.0076	0.711	-0.0853	0.538	-0.1305	0.721	-0.1305	0.721	0.0292	0.047	-0.0126	0.949	0.0052	0.752
RM4	-0.0104	0.625	0.0318	0.831	0.2133	0.604	0.2133	0.604	0.0229	0.084	0.0300	0.847	-0.0030	0.865
LU1	-0.0568	0.004	0.2868	0.018	0.8349	0.006	0.1721	<0.001	0.0455	<0.001	0.0899	0.589	0.0212	0.328
RU1	-0.0703	0.007	0.4251	0.011	1.1681	0.009	0.2135	0.004	0.0595	0.002	0.1186	0.418	0.0673	0.015
LU2	-0.0546	0.004	0.2839	0.017	0.7588	0.005	0.1783	0.002	0.0473	0.004	0.4620	0.013	0.1101	<0.001
RU2	-0.0476	0.014	0.2191	0.048	0.4856	0.034	0.1009	0.100	0.0223	0.211	0.2876	0.050	0.0401	0.038
LU3	-0.0136	0.494	0.0375	0.798	0.2407	0.644	0.2290	0.014	0.0519	0.034	0.0274	0.852	-0.0145	0.702
RU3	-0.0177	0.440	0.0954	0.500	0.3817	0.473	0.3817	0.473	0.0248	0.197	-0.0377	0.789	0.0594	0.146
LU4	-0.0590	0.032	0.3751	0.033	1.8700	0.002	0.6305	<0.001	0.1848	<.000	0.5032	0.045	0.0573	0.024
RU4	-0.0482	0.027	0.2328	0.134	0.9277	0.062	0.9277	0.062	0.0702	<.0001	-0.1095	0.569	-0.0098	0.588

LU+	-0.0714	0.384	0.0111	0.982	-0.2770	0.853	0.2453	0.179	0.0605	0.259	0.4343	0.333	-0.0525	0.232	
RU+	-0.0563	0.350	0.1351	0.723	0.1227	0.922	0.0672	0.644	0.02486	0.556	-1.1652	0.002	-0.0187	0.704	
LR2	0.0144	0.659	-0.1579	0.357	-0.0232	0.939	0.0662	0.176	0.0171	0.185	-0.3630	0.020	0.0015	0.975	
RR2	0.0813	0.001	-0.4465	0.001	-0.2775	0.086	0.0796	0.025	0.0218	0.017	-0.0368	0.871	0.0072	0.782	
LR3	-0.0249	0.202	0.0928	0.518	0.3334	0.420	0.0021	0.965	-0.0016	0.908	-0.0469	0.790	-0.0207	0.349	
RR3	0.0157	0.503	-0.1625	0.242	-0.2173	0.478	-0.0319	0.459	-0.0083	0.491	-0.3009	0.079	0.0060	0.781	
LT2	-0.0345	0.099	0.0990	0.474	0.3798	0.380	0.2351	0.003	0.0651	0.004	0.0032	0.980	0.0237	0.341	
RT2	-0.0501	0.020	0.1665	0.263	0.4819	0.289	0.1035	0.076	0.0281	0.098	-0.2137	0.164	-0.0621	0.006	
LT3	-0.0371	0.115	0.4328	0.045	1.8459	0.016	0.2196	0.005	0.0613	0.003	0.1547	0.163	0.0394	0.094	
RT3	-0.0669	0.006	0.5801	0.010	1.8136	0.018	-0.0163	0.776	-0.0036	0.800	-0.002	0.991	0.0087	0.707	
LT4	-0.0632	0.019	0.3593	0.095	1.3906	0.081	0.2749	0.002	0.0797	0.002	-0.1306	0.407	0.0133	0.562	
RT4	-0.0212	0.345	0.1084	0.531	0.5160	0.391	0.1820	0.091	0.0473	0.136	-0.1226	0.397	0.0166	0.487	
LCF1-LT1	-0.0213	0.330	0.0595	0.706	0.1366	0.813	0.3747	0.005	0.1078	0.006	0.4999	<0.000	0.0486	0.002	
RCF1-RT1	-0.0416	0.070	0.2492	0.124	0.8171	0.158	0.0312	0.804	0.0052	0.889	0.1631	0.275	0.0148	0.345	
LCF2	-0.0259	0.232	0.1016	0.484	0.3704	0.334	0.2450	<0.000	0.0755	<0.001	0.2081	0.022	0.0782	0.001	
RCF2	-0.0264	0.335	0.0759	0.665	0.1049	0.845	-0.0199	0.817	-0.0149	0.567	0.1046	0.175	0.0232	0.432	
LCF3	-0.0439	0.120	0.1739	0.292	0.7380	0.085	0.2894	0.001	0.0875	<0.001	-0.0683	0.730	0.0576	0.180	
RCF3	0.0058	0.833	-0.1067	0.560	0.2786	0.637	0.2531	0.011	0.0788	0.007	-0.0803	0.638	0.0791	0.018	

Nerves were examined at several locations. The median nerve was assessed in the carpal tunnel (M1), 10 cm above the carpal tunnel (M2), at the cubital fossa (M3), and 10 cm above the cubital fossa (M4). The radial nerve was assessed 3 cm above the cubital fossa (R2) and in the radial groove (R3). The ulnar nerve was assessed at the carpal striation (U1), 10 cm above the carpal transverse crease (U2), at the olecranon (U3), and 2 cm and 10 cm above the olecranon (U+/U4). The tibial nerve was assessed at the popliteal nerve bifurcation (T2), 5 cm below the popliteal fossa (T3), and at the medial malleolus (T4). The common peroneal-tibial nerve was assessed 5 cm above the popliteal fossa (CF1-T1). The common peroneal nerve was assessed at the bifurcation of the popliteal fossa (CF2) and at the fibular head (CF3).

Supplementary Table 5 Considering the duration, the estimates and P-values of the neuroradiological characteristics of type 2 leprosy reactions compared with the no leprosy reaction group.

	Intensity characteristics						Morphological characteristics							
	Hmean	P-value	Hskew	P-value	kurtV	P-value	areaOri	P-value	Meanvth	P-value	Meanvlo	P-value	Solidity	P-value
LM1	0.0329	0.443	-0.5079	0.148	-1.4876	0.246	-0.036	0.731	0.0059	0.836	-0.2592	0.482	-0.1354	0.01
RM1	0.0173	0.658	-0.2511	0.468	-0.6149	0.611	-0.0311	0.789	-0.0111	0.756	-0.2672	0.442	-0.0714	0.175
LM2	-0.0084	0.843	0.0535	0.817	0.4544	0.45	0.0432	0.563	0.0135	0.542	0.0702	0.798	0.0409	0.105
RM2	0.0165	0.735	-0.2232	0.429	-0.7636	0.347	-0.3277	0.005	-0.0935	0.006	-0.3526	0.241	0.009	0.708
LM3	0.0011	0.981	-0.2282	0.536	-0.3876	0.697	0.1363	0.231	0.0328	0.251	0.0998	0.827	-0.0471	0.516
RM3	-0.0079	0.837	0.0881	0.744	0.7417	0.252	-0.0135	0.903	0.0092	0.725	-0.2984	0.485	0.0241	0.709
LM4	-0.0056	0.894	-0.0930	0.743	0.2404	0.748	0.0869	0.433	0.0231	0.433	-0.5273	0.193	0.039	0.249
RM4	0.0687	0.115	-0.5490	0.075	-1.7056	0.045	-0.1914	0.056	-0.044	0.1	-0.0125	0.968	-0.0653	0.069
LU1	-0.0218	0.575	0.0929	0.700	0.4366	0.466	0.0621	0.471	0.0389	0.087	-0.4974	0.153	-0.0163	0.714
RU1	-0.0289	0.569	0.1355	0.678	0.0041	0.996	-0.1261	0.372	-0.0478	0.186	-0.1955	0.513	-0.0991	0.073
LU2	0.0342	0.376	-0.3112	0.202	-0.3984	0.467	0.0116	0.918	0.0094	0.774	-0.4021	0.292	0.0912	0.126
RU2	-0.0175	0.642	-0.0336	0.878	0.1071	0.813	0.2067	0.097	0.0487	0.178	-0.4671	0.113	-0.0213	0.576
LU3	0.0837	0.055	-0.7208	0.027	-2.7303	0.019	-0.2589	0.183	-0.05	0.333	-0.3289	0.305	-0.0794	0.333
RU3	-0.0478	0.298	0.2618	0.357	1.1631	0.278	0.17	0.24	0.0462	0.23	0.3144	0.268	0.0566	0.485
LU4	0.1695	0.004	-1.2439	0.001	-3.9549	0.001	-0.7544	0.007	-0.2125	0.008	-0.6351	0.212	-0.1297	0.014
RU4	0.0095	0.8237	-0.2331	0.453	-0.04728	0.9617	0.0751	0.49	0.0247	0.436	-0.5482	0.163	-0.0184	0.616

LU+	0.3945	0.031	-1.848	0.089	-3.6893	0.2474	-0.5428	0.1574	-0.1358	0.228	-1.5614	0.106	0.0914	0.318
RU+	0.1828	0.152	-1.0438	0.198	-2.9181	0.2696	-0.09352	0.7574	-0.02425	0.782	0.7296	0.298	-0.2330	0.033
LR2	0.034	0.604	-0.1652	0.630	-0.111	0.857	-0.0339	0.727	-0.0222	0.389	-0.2190	0.470	0.1580	0.108
RR2	0.0799	0.127	-0.4188	0.130	-0.4517	0.206	-0.1048	0.176	-0.0338	0.091	-0.4732	0.352	-0.0584	0.320
LR3	0.0532	0.172	-0.3417	0.235	-0.8907	0.281	-0.0448	0.638	-0.0248	0.381	0.3919	0.266	-0.0667	0.132
RR3	0.0833	0.081	-0.4351	0.121	-0.9374	0.131	-0.1529	0.082	-0.0474	0.056	0.5085	0.137	-0.0494	0.253
LT2	-0.0077	0.851	0.0433	0.875	0.0883	0.918	-0.2037	0.172	-0.0532	0.222	-0.1824	0.477	-0.0422	0.396
RT2	0.0498	0.229	-0.3687	0.210	-1.0859	0.227	-0.2172	0.059	-0.0582	0.082	-0.1079	0.718	-0.0727	0.094
LT3	0.0332	0.484	-0.1435	0.739	-1.3851	0.360	-0.4710	0.003	-0.1191	0.004	-0.2701	0.233	-0.0350	0.462
RT3	-0.0259	0.571	0.3037	0.474	0.6544	0.653	-0.0989	0.385	-0.0054	0.848	-0.099	0.775	-0.0069	0.879
LT4	0.0237	0.643	-0.0533	0.898	0.4251	0.782	0.0208	0.900	0.0265	0.570	-0.2818	0.364	0.0070	0.877
RT4	0.0340	0.450	-0.1746	0.615	-0.3547	0.768	-0.1895	0.374	-0.0364	0.564	-0.9127	0.003	-0.0902	0.065
LCF1-LT1	0.0158	0.710	-0.2344	0.448	-0.6483	0.567	-0.2592	0.299	-0.0729	0.321	0.2717	0.24	0.0071	0.803
RCF1-RT1	-0.0095	0.832	-0.0284	0.929	0.1081	0.924	-0.0582	0.816	-0.0103	0.889	0.0617	0.835	0.0238	0.446
LCF2	0.0544	0.206	-0.3115	0.280	-0.7178	0.344	-0.1179	0.331	-0.0337	0.302	-0.2930	0.098	-0.0818	0.061
RCF2	0.0833	0.126	-0.5370	0.125	-1.2280	0.248	-0.0891	0.598	-0.0186	0.716	0.0230	0.878	0.1347	0.025
LCF3	0.0396	0.468	-0.1977	0.538	-0.5874	0.476	-0.2527	0.114	-0.0694	0.112	-0.2752	0.477	-0.0511	0.539
RCF3	0.0316	0.531	-0.2649	0.434	-0.6449	0.554	-0.2234	0.208	-0.0538	0.297	-0.0098	0.975	0.0005	0.993

Nerves were examined at several locations. The median nerve was assessed in the carpal tunnel (M1), 10 cm above the carpal tunnel (M2), at the cubital fossa (M3), and 10 cm above the cubital fossa (M4). The radial nerve was assessed 3 cm above the cubital fossa (R2) and in the radial groove (R3). The ulnar nerve was assessed at the carpal striation (U1), 10 cm above the carpal transverse crease (U2), at the olecranon (U3), and 2 cm and 10 cm above the olecranon (U+/U4). The tibial nerve was assessed at the popliteal nerve bifurcation (T2), 5 cm below the popliteal fossa (T3), and at the medial malleolus (T4). The common peroneal-tibial nerve was assessed 5 cm above the popliteal fossa (CF1-T1). The common peroneal nerve was assessed at the bifurcation of the popliteal fossa (CF2) and at the fibular head (CF3).