

CO₂ laser treatment for scars after cleft lip surgery: A systematic review and meta-analysis

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Supplemental Table 1 Search strategies for databases.

Database	Date of coverage	Search strategy
Pubmed 48	until August 8, 2023	((laser) AND ((cleft lip) OR (cleft palate) OR (cleft lip or palate) OR (CL/P)) AND ((scar) OR (scars) OR (cicatrix))
EMBASE 22	until August 8, 2023	#1 'cleft lip':ti,ab,kw OR 'cleft palate':ti,ab,kw OR 'cleft lip or palate':ti,ab,kw OR 'CL/P':ti,ab,kw #2 scar:ti,ab,kw OR scars:ti,ab,kw OR cicatrix:ti,ab,kw #3 laser:ti,ab,kw #4 #1 AND #2 AND #3
Web of Science 70	until August 8, 2023	#1 TS=(cleft lip) OR TS=(cleft palate) OR TS=(cleft lip or palate) OR TS=(CL/P) #2 TS=(scar) OR TS=(scars) OR TS=(cicatrix) #3 TS=(laser)

		#4 #1 AND #2 AND #3
Cochrane Library 15	until August 8, 2023	#1 (cleft lip):ti,ab,kw OR (cleft palate):ti,ab,kw OR (cleft lip or palate):ti,ab,kw #2 (scar):ti,ab,kw OR (scars):ti,ab,kw OR (cicatrix):ti,ab,kw #3 (laser):ti,ab,kw #4 #1 AND #2 AND #3
CNKI 11	until August 8, 2023	(唇裂 + 唇腭裂) * 激光 * (瘢痕 + 疤痕)

Supplemental Table 2: The protocol of laser treatment for postoperative scar of cleft lip.

Source	Laser types	Laser dosages	Treatment time	Follow-up visit
Chi et al. 2023	Fractional CO ₂ laser	Deep FX 20 to 30 J/10%.	3 times at an interval of 1 month.	At least 6 months
Hao et al. 2022	10600 nm ultra-pulsed CO ₂ lattice laser and dual wavelength pulsed laser (585 nm pulsed dye laser and 1064 nm Nd:YAG laser)	Dual wavelength pulse laser therapy: Two types of lasers, 585nm pulsed dye laser and 1064nm Nd: YAG, are sequentially emitted using the Synergy skin laser therapy instrument. Pulse dye laser wavelength 585nm, spot 7mm, energy 6.5-	Each treatment takes approximately 20-30 minutes. Treat once a month.	6~12 months

		9J/cm², pulse width 0.5-6ms; Nd: YAG laser has a wavelength of 1064nm, a spot of 7mm, an energy of 30-60J/cm², and a pulse width of 15ms. CO₂ dot matrix laser treatment: Super pulse CO₂ dot matrix laser Acuscan micro scanning tool, diamond shaped spot, shallow mode: 50J/cm², density 40%, deep mode: 27.5J/cm², density 5%, scanning once per treatment. For obvious areas with depressions: 7.5J/cm², density 5%, and full coverage of scars.		
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Shadad et al. 2021	10,600 nm fractional CO ₂ laser	Scanner mode, time of pulse from 0.1 to 0.2 ms, pixel per inch from 5 to 6, and power from 20 to 25 w.	5 to 7 sessions with 4 weeks of interval.	At least 6 months
Li et al. 2019	lattice CO ₂ laser and intense pulsed light	lattice CO ₂ laser: deep (15-20 mJ, 5% density,) and superfical (80-100 mJ, 5% density); Intense pulsed light: 590 nm filter; double pulse; pulse width, 4-6 ms; energy density, 25-28 J/cm ² .	The laser treatment was administered every 3 months. The IPL treatment was repeated monthly from 1 month to 6 months.	At least 12 months
Aida et al.	10,600 nm fractional CO ₂ laser	Power 22.5 mJ, pulse width 500 microsecond, stack 3 and density 0.8.	6 sessions every four weeks for six months.	At least 6 months

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Supplemental Table 3 The Grading of Recommendations Assessment, Development, and Evaluation (GRADE) assessment for effectiveness of laser therapy on postoperative scar of cleft lip.

Outcome	No. of Studies	Study Design	Certainty Assessment					WMD [95% CI]	Certainty
			Risk of Bias	Inconsistency	Indirectness	Imprecision	publication bias		
VSS	5	RCT	not serious	serious	not serious	serious	not serious	WMD=4.39, 95%CI=0.54-8.23, I ² =99.4%	⊕⊕ LOW

WMD, weighted mean difference.