TABLE 1
Study List and Details

Author	EL	Characteristics	Study	Lesions	Laser setting	Outcomes	Results	Findings
CO_2								
Castillo et al	D	N/proc:29/NA Age:14 months old-84 years old Gender:10F/19M	Retrospective	Laryngeal Papillomatosis	3-6W continuous power 100-200Hz repeition rate	Complications HPV detected recurrence remission(No recurrence occurred within two months) clearance(No recurrence occurred within three years) cure(No recurrence occurred within five years)	n=3/29(10.4%) n=22/29(75.8%), mainly HPV6 and HPV11 n=13/29(44.8%) n=6/29(20.7%) n=10/29(34.5%) n=12/29(41.3%)	Papillomatosis is characterised as a pathology with an unpredictable course and with a low probability of malignancy. CO2 laser surgery has meant a revolution in symptomatic treatment, but there is presently no curative treatment
Dedo et al	D	N/proc:109/548 Age:NA Gender:43F/66M	Retrospective	Laryngeal Papillomatosis	NA	Compilcations: acute upper airway obstruction anterior glottic webbing Remission Malignant Degeneration Death	n=2(1.8%) n=9(8.1%) n=45(41.3%) n=3(2.7%) n=0(0%)	Treatment of LP with CO2 laser followed by podophyllum paint□ing represents a clear advance over traditional me□chanical methods of papilloma removal when voice quality, remission rate, and especially incidence of complications, and occurrences of death are considered
Dedo et al	D	N/proc:244/548 Age:NA Gender:81F/163M	Retrospective	Respiratory Papillomas	20 W continuous power 0.2 seconds to continuous exposure time 1 to 2 mm spot siz	Compilcations: anterior glottic webbing Remission Clearance Cure Malignant Transformation Death	n=68(27%) n=93(37.3%) n=15(6.1%) n=43(17.2%) n=4(1.6%) n=0(0%)	A true cure with elimination of all human papilloma viruses (particularly types 6 and 11) will not be achieved until a uniformly effective vaccine or antiviral and immunomodulating agents are developed
Holler et al	D	N/proc:6/90 Age:3-17 years old Gender:6M	Prospective	Juvenile-onset Recurrent Respiratory Papillomastosis	NA	Jitter% Shimmer% NHR% CAPE-V	4.57 14.66 0.31 60	the data demonstrate a correlation of worsening voice quality with increased exposure to the CO2 laser
Koji et al	D	N/proc:9/14 Age:30-56 years old Gender:5M/4F	Prospective validation	Recurrent Respiratory Papillomastosis	2-3w continuous or super pluse power	Recurrence	n=3/9(33.3%)	CO2 TNFLS is feasible as an in-office surgery for patients with laryngopharyngeal pathologies. The therapeutic outcome is as expected with advantage of low patient burden and easy to repeat.
Hu et al	D	N/proc:6/10 Age:NA Gender:NA	Retrospective	Recurrent Respiratory Papillomastosis	5w power in super pulse with 0.05s on an	Complication Incomplete sugery Introlerance	N=0/10 N=2/10 N=1/10	With meticulous patient selection, office-based laryngeal surgery performed using a carbon dioxide laser appears to be a feasible treatment option for various types of vocal lesions.
Preuss et al	D	N/proc:64/137 Age:NA Gender:NA	Retrospective	Recurrent Respiratory Papillomastosis	25 W	Complications: glottic webs, scar temporary laryngeal edema airway fire Recurrence, Malignant transformation, Secondary airway carcinoma	n=4/64(6%) n=2/64 n=0/64 n=3(4%)	Laser microsurgery is the preferential treatment modality due to the low rate of severe scarring and a lower tracheostomy rate as compared with laryngeal microsurgery with cold instruments.
Robb	D	N/proc:5/11 Age:2.5-23 years old Gender:4F/7M	Retrospective	Recurrent Laryngeal Papilloma	10-30w in intermittent or plused	Complications Remission(more than 1 year) Intractable airway obstruction	n=0/11 n=5/11 n=2/11	What the laser has to offer over other modalities, is the ability frequently to treat the paediatric larynx, with little risk of post-oper□ative oedema or bleeding, reduced hospital in-patient stay, and only mild discomfort. However, even using frequent laser treatment, a small number of severely affected children will require tracheotomy for incipient or overt respiratory obstruction
Saleh	D	N/proc:3/NA Age:1-7 years old Gender:NA	Retrospective	Recurrent Laryngeal Papillomatosis	8-10w power	Complications	n=0/3	NA
Mattot et al	D	N/proc:37/595 Age:1-56 years old Gender:11F/26M	Retrospective	Laryngeal Papillomatosis	NA	Complications: carcinoma of larynx bronchial papillomata Remission	n=1/37 n=0/37 n=13/37(35%)	The number of operations per year does not cor□relate with eventual remission
KTP								
Burns et al	D	N/proc: 37/55 Age: 23-73 years old Gender: 16F/21M	Prospective Uncontrolled	recurrent laryngeal papillomatosis	15 ms pulse width 5.25–7.5 J/pulse 2 Hz repetition rate 20–80 J/cm² fluence	Complications >90 regression(4-12weeks) 75%-89% and 15%-74% regression	N:0/51 n=28/35 n=4/35 to 3/35	KTP laser procedure is useful and safe for recurrent papillomatosis. The majority of patients had >90% of lesion regression at 4 to 12weeks postoperative
Hung et al	D	N/proc: 16/79 Age: 23-73 years old Gender: 6F/10M	Prospective	Recurrent respiratory papillomatosis	30–50 ms pulse width 7–8 W 2 Hz repetition rate	Complications VHI-10: (1) before operation; (2) after the first operation; (3) after 2 to 5 repeated in-office or in-hospital procedures; (4) after 6 to 10 procedures CPPs: (1) before operation; (2) after the first operation; (3) after 2 to 5 repeated in-office or in-hospital procedures; (4) after 6 to 10 procedures GRB: (1) before operation; (2) after the first operation; (3) after 2 to 5 repeated in-office or in-hospital procedures; (4) after 6 to 10 procedures	NA (1) 28.3; (2)12.0; (3)10.1; (4)11.0 (1) 6.8; (2)10.5; (3)10.9; (4)11.3 (1) 5.0; (2)2.4; (3)2.4; (4)1.4	KTP laser can be an effective tool for managing RRP. Voice quality can be well preserved even after a dozen KTP laser procedures
Kaluskar et al	D	N/proc: 9/NA Age: 39-58 years old Gender: 2F/7M	Prospective Uncontrolled	Inverted papilloma of the nose and paranasal sinuses	8 W of power in continuous mode at least 80% calibration	Compilcations Recurrence (1 year)	n=0/9 n=1/9	KTP laser is a good option in view of the low rates of recurrerice and the minimal postoperative morbidity
Wei et al	D	N/proc:18/33 Age:12-68 years old Gender:F3/M15	Retrospective	Recurrence Laryngeal Papilloma	6w of power	Complications Cure Effective(tumour remission rate>50%) Ineffective(tumour remission rate<50%)	n=0 n=11/17 n=3/17 n=3/17	KTP laser is safe and effective in the treatment of recurrent laryngeal papilloma
Liu et al	D	N/proc:22/NA Age:3-60 years old Gender:NA	Retrospective	Laryngeal Papilloma	NA	Complications Cure Recuurence	n=2/22 n=19/22 n=3/22	KTP laser treatment is less destructive and it has high accuracy and precision, also with good hemostatic effect

TABLE 2
Study Characteristics at Preoperation

Outcome	KTP laser[a]	Patients, n	CO_2 laser[a]	Patients, n	P value[b]
Age	49.83±7.05	91	34.83±7.36	85	**＜0.001**
Male	65.61% (292 of 445)	445	66.25% (53 of 80)	80	＞0.05

[a] Values are presented as mean ± SD.

[b] Between group KTP and group CO_2. Bold indicates P<0.05.

TABLE 3
Clinical outcome comparsions

Outcome	KTP laser	Surgery, n	CO_2 laser	Surgery, n	P value[a]
Cure	87.25% (89 of 102)	102	75.98% (389 of 512)	512	**0.0127**
Complications	2.32% (2 of 86)	86	17.71% (88 of 497)	497	**<0.0001**
Recurrence	9.80% (10 of 102)	102	10% (34 of 340)	340	0.2967

[a] Between group CO_2 and group KTP. **Bold** indicates P<0.05.