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Unconventional Uses of Laser Hair Removal: A Review

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Abstract

Laser hair removal since its availability has been primarily used for aesthetic purposes. Over the years, it has emerged as an important therapeutic modality in various dermatological and surgical disorders, both as an adjuvant and as a monotherapy. Depending on the skin type, all laser hair removal systems have been used with good results and minimal complications. We hereby review the diverse range of unconventional indications of laser hair removal.

Keywords: Folliculitis decalvans, hairy flaps, hidradenitis suppurativa, laser hair removal, pilonidal sinus, unconventional indications

Introduction

Lasers are indispensible tools in dermatology. Laser hair removal (LHR) remains one of the most commonly availed laser treatments in dermatology practice. It has received great interest because of its noninvasiveness, long-term results, minimal treatment discomfort, and procedure speed.[1] LHR functions on the principle of selective photo-thermolysis with melanin serving as the target chromophore, whereby there is selective destruction of hair follicle resulting in permanent hair reduction.[2] LHR can be performed with ruby, Alexandrite, diode, and neodymium:yttrium aluminum garnet (Nd:YAG) lasers and intense pulse light (IPL) sources, which operate at different wavelengths suitable for different skin types.[3]

The primary indication of LHR is aesthetic removal of unwanted hair in females with hirsutism and hypertrichosis. The efficacy of different laser systems to reduce hair growth, with reduction in the number of hair counts as the endpoint, has been reported by various long-term studies. Improvement in efficacy with repetitive treatments has also been reported.[4]

Over the years, a number of dermatological conditions associated with hair follicular pathology as the primary dysfunction have been treated with LHR. These include chronic inflammatory disorders such as pilonidal sinus disease (PSD), hidradenitis suppurativa (HS), dissecting folliculitis, pseudofolliculitis barbae (PFB), and others. These diseases are thought to result from occlusion, rupture, and inflammation of the follicular unit.[5] Current medical treatment options available for these disorders are frequently associated with partial improvement as well as relapses and recurrences. Laser-induced damage and epilation of hair follicles is a promising therapy for these disorders.

In addition to the disorders associated with follicular inflammation, conditions associated with aberrant hair growth, either congenital or postsurgical, also require permanent hair removal or reduction. LHR is the procedure of choice to prevent recurrence in these cases. LHR for these conditions is a safe and well-tolerated treatment option and has been employed safely even in children resulting in sustained symptomatic and functional improvement.[6] Side effects associated with LHR in these indications are minor, self-limiting, and of low incidence.[7]

Unconventional Indications of LHR

Pilonidal sinus

PSD of the natal cleft is a painful and debilitating condition. Although the standard treatment involves complete surgical excision of the sinus tract, recurrence is common, varying from 11 to 14%.[8] Because of its association with excessive hair in sacrococcygeal region, laser epilation has been reported to be beneficial as an adjunct to surgery [Table 1].[9,10,11,12,13,14,15,16,17,18,19,20] Four sessions of LHR have been advised to obtain the best results.[21] Relapse rate is high if less than 4 sessions are used; one study with mean of 2.7 sessions reported a recurrence rate of 13.3% over a follow-up period of 4.4 years.[22] LHR in PSD is usually well tolerated and without any major complications. The pain associated with the procedure can be minimized with the use of topical/local anesthetic agents. PSD with frequent disease recurrences, despite multiple surgical interventions and antibiotic treatments, was successfully treated with LHR resulting in healing of persistent sinus, reduction in hair thickness and density, and also improved quality of life [Figure 1]. No disease exacerbations were noted after 6–8 sessions.[23] A long-term follow-up study reported no recurrence in 86.6% of patients following LHR over a period of 5–7 years.[22] Diode laser, Nd:YAG laser, and Alexandrite laser as well as IPL systems have been used in different studies in this indication and all of these devices have shown positive results. The longest follow-up has been of 5.5 years in one study with diode laser. No recurrences were reported in this long follow-up period in the study.[11]

Hidradenitis suppurativa

HS is a chronic disabling disorder, with exacerbations, recurrence, and progression despite medical and extensive surgical treatment. In view of mounting evidence for a primary follicular pathogenesis, LHR has been used in the treatment of HS with promising results.

Significant therapeutic benefit has been reported in this condition after LHR with diode laser, Nd:YAG laser, and IPL devices [Table 2].[24,25,26] Long pulse Nd:YAG laser has been the preferred laser for this indication because of its deeper tissue penetration. Histopathological changes in 20 patients of HS followed using biopsy specimens obtained at specified intervals before and after treatment correlated with the degree of clinical improvement in them after treatment with a long-pulsed 1064-nm Nd:YAG laser. The patients received two treatments to an affected area; untreated affected areas served as controls. Laser parameters were adjusted based on skin type and ranged from 25 to 50 J/cm^2 with a 10-mm spot size and a 20- to 35-ms pulse duration. Double pulse stacking was used at the first treatment, and triple at the second treatment on all inflammatory lesions. By 1 month, inflammation had decreased and broken hair shafts were noted. At 2 months, the investigators found scarring, fibrosis, and minimal inflammation. As measured by a Lesion Area and Severity Index score modified for HS, a significant improvement of 32% in treated areas was noted 2 months after the second treatment.[27] Significant improvement (72.7%) was also observed during the 4 months of treatment and 2 months posttreatment, both clinically and histologically in another study. To be effective, the treatments need to be quite aggressive, as evidenced by the stacked pulses used and the histologic evidence of scarring and fibrosis. Inflammatory lesions healed faster after laser treatment but inframammary region improved the least.[28] No recurrence was observed for a follow-up period of 3 years when LHR was followed by deroofing with carbon dioxide (CO_2) laser.[29]

Dissecting cellulitis

Dissecting cellulitis is a chronic inflammatory scalp condition characterized by pustular nodules, sinus tract formation, and resultant cicatricial alopecia. Current treatments are of limited efficacy. Destructive therapy using X-rays is effective but no longer recommended. LHR has been effective in attenuating the progression of dissecting cellulitis without appreciable adverse side effects. Patients achieve decreased pus formation, reduced reliance on systemic treatments, and a controlled or terminated disease process without dyspigmentation.[30] A severe case of recalcitrant dissecting cellulitis of the scalp had no recurrence in 6-month follow-up after 4 treatment sessions of diode laser as monotherapy.[31] In addition, some patients have reported regrowth of terminal hairs in treatment sites, 1 year after initiating laser treatment.[30]

Folliculitis decalvans

Folliculitis decalvans (FD) is a group of inflammatory scalp disorders characterized by follicular papules and pustules and tufted folliculitis followed by cicatricial alopecia. Current treatments mainly consist of antibiotic therapies and are often disappointing. Recalcitrant FD has been successfully treated with LHR in a few studies on limited number of cases.[32,33,34] In all these studies, long pulse Nd:YAG laser was used over multiple sessions and treatment was well tolerated.

Pseudofolliculitis barbae

PFB affects a large number of individuals with coarse curly hair, and present treatment options are suboptimal. Shaving is a predisposing factor because it results in sharp and short hair stumps, which reenter the skin or retract into the follicular wall. LHR has been shown to be potentially helpful in mitigating disease severity by reducing the number and/or thickness of hair shafts [Table 3]. Greater than 50% improvement has been observed in long-standing PFB after LHR.[35,36,37,38,39,40,41,42] In PFB, LHR with Nd:YAG laser has been reported as a safe and effective option for reducing hair and subsequent papule formation. Papule counts performed 90 days after treatment using the highest doses tolerated by the epidermis (50, 100, and 100 J/cm^2 for type IV, V, and VI skin, respectively) were significantly reduced in the laser-irradiated area as compared to the control.[43] Another study reported 56% mean reduction in PFB lesions after using three passes of Nd:YAG laser.[44] Five weekly low-fluence (12 J/cm^2) laser treatment at 1064nm also achieved significant temporary reduction in PFB refractory to conservative therapy over the anterior neck.[45] Marked decrease in hair density and disease exacerbations at follow-up were noted after Alexandrite LHR for below knee amputation stump PFB.[23]

Acne keloidalis nuchae

Acne keloidalis nuchae is a chronic inflammatory disorder involving hair follicles on the nape of the neck, resulting in disfiguring keloidal scars. Treatment modalities available have been met with limited success. As with other chronic inflammatory follicular disorders, LHR is being evaluated as a first-line treatment modality and is promising to be safe and effective with low recurrence.[46] Clearance of 90–97% of lesions has been reported in a study, after 4 treatment sessions with diode laser.[47] Improvement was significantly higher in early cases as compared to late cases in patients treated with Alexandrite and Nd:YAG lasers.[46,48] However, Er:YAG laser proved to be more effective in early as well as late cases as compared to Nd:YAG laser.[49]

Trichostasis spinulosa

Trichostasis spinulosa is a disorder characterized by multiple hairs emerging out of a hyperkeratotic follicular opening, presenting as dark spinous plugs. Available treatment modalities provide temporary relief only. LHR therapy has been used as a definitive therapy, removing the hair responsible for the plugged appearance.[50] Its effectiveness has been reported,[51,52] with minimal discomfort and side effects, and no recurrence in 90% of the cases, even after 2 years.[53]

Keratosis pilaris

Keratosis pilaris (KP) is a common skin disorder of follicular prominence and erythema that typically affects the proximal extremities. It can be disfiguring and is often resistant to treatment. Shorter-wavelength vascular lasers have been used to reduce the associated erythema but not the textural

irregularity. Significant improvement in skin texture and roughness/bumpiness was noted in KP patients after 3 treatment visits spaced 4–5 weeks apart with the 810-nm diode laser.[54]

Axillary hyperhidrosis

Axillary hyperhidrosis is a distressing disorder of eccrine sweat glands. The available treatments have limited efficacy and systemic side effects, and there is no ideal treatment option available as of now. Significant subjective and objective improvement in sweating was observed with monthly sessions of LHR using Nd:YAG laser.[55,56] In one of these studies, which was a right–left controlled comparison trial, significant subjective and objective improvement was noted in sweating after monthly sessions of LHR.[55] On histopathology, destruction of eccrine glands was noted following LHR.[57] In contrast to the aforementioned studies, no statistically significant difference was seen between the two sides in a controlled left–right comparison trial with 800-nm diode laser. However, both sides did demonstrate reduction in sweat rates, probably indicating a placebo effect.[58]

Becker's Nevus

Becker's Nevus is an aesthetically troublesome condition. Although a number of lasers have been used in this condition, the response remains unsatisfactory in majority of cases. Reduction in hair density and delayed hair growth over Becker's nevus has been reported following LHR[59,60,61,62,63] [Table 4]. Hypertrichosis with the background of hyperpigmentation poses a challenge for LHR in Becker's nevus. There is risk of blistering due to pigment absorption by pigmented epidermis. Significant hair clearance was noted at 12 months, with low fluence high repetition rate diode lasers for gradual heating of the hair shaft and perifollicular tissue.[64] Becker's nevus in a 20-year-old male was successfully treated with 6 sessions of long-pulsed 1064-nm Nd:YAG laser at 6-week intervals followed by 5 sessions of long-pulsed 755-nm Alexandrite laser at 3-month intervals.[65] Use of LHR has been reported in other nevoid conditions also.[66,67,68] Alexandrite laser has also been used in two cases of nevoid localized\hypertrichosis in children aged 10 and 12 years.[23]

Hair-bearing skin flaps and grafts

Hair-bearing skin flaps and grafts result in hair growth at aberrant body site following surgical reconstruction. LHR has been used after reconstruction in breast cancer, on nose following basal cell carcinoma resection, in fingertip reconstruction following degloving firework blast injury, postburns, and other injuries with good results.[23,69,70]

Reconstruction of intraoral structures

Reconstruction of intraoral structures in head and neck cancers may often include the transfer of flaps composed of hair-bearing skin. Patients with hairy intraoral flaps often present with irritation, pooling of saliva, and trapping of food. LHR has been used as method of epilation in them.[71,72,73,74,75,76] Laser treatment resulted in effective hair reduction in intraoral hair regardless of flap type except in one male with white hair.[77] LHR is very difficult in such cases due to poor visibility and the bulky hand piece of laser in the confined oropharyngeal space. Marked symptom improvement was noted in a patient with reconstructed hypopharynx postlaryngopharyngectomy using Alexandrite laser, with a 7-mm hand piece with 90° side-firing fiber-optic attachment passed through the lumen of a suspension laryngoscope[78] [Table 5].

Genital gender affirming surgery

Genital gender affirming surgery (GAS) involves reconstruction of the genitals to match the patients identified sex. The use of hair-bearing flaps in this procedure results in postoperative intravaginal and intraurethral growth hair growth and associated complications.[79,80,81,82] Despite long experience with electrolysis for hair removal prior to GAS,[83,84] LHR has been shown to be the superior modality.[85,86] It is best to wait 3 months after the last planned hair removal treatment before proceeding with surgery, in order to confirm that no further hair regrowth will occur.[87] Vaginoplasty without creation of a neovaginal cavity generally does not require any hair removal preoperatively. Vaginoplasty with creation of a neovaginal cavity requires that the penile shaft skin be made hair-free (penile inversion vaginoplasty),

[88] and in some cases it is the safest to treat the entire scrotum for permanent hair removal. Transgender men undergoing phalloplasty with urethral lengthening (construction of a neourethra) require preoperative permanent hair removal of the skin flap. Skin for phalloplasty with urethral lengthening is commonly harvested from the medial aspect of the entire ventral forearm in radial artery phalloplasty[89] or the middle 2/3 anterolateral thigh (ALT) in ALT flap phalloplasty.[90] No intravaginal hair growth was demonstrated following LHR on scrotal skin prior to genital GAS at 15 months after vaginoplasty.[23]

Urethral repair

Urethral repair following hypospadias and stricture repair is carried out using cutaneous flaps, usually hair bearing. Urethral calculi formation, due to the intraurethral hair follicle, is the major complication associated with this surgery. Use of LHR for removal of urethral hair has been described in several case reports with minimal side effects and satisfactory outcomes up to 1 year of follow-up.[91,92,93] Postoperative transurethral LHR has been performed with diode laser at a power of 15 W through a side-firing laser fiber.[94]

Peristomal hair growth

Peristomal hair growth presents a problem for many people with an ileostomy. Importantly it may cause difficulty for adhesion of the stomal appliance to the skin. Shaving particularly, if frequent, can often be effective, but it may cause folliculitis. LHR has resulted in effective epilation, resulting in improved stoma appliance adhesion and reduced risk of trauma and infection.[95,96]

Hair restoration surgery to redesign frontal hairline in women

Hair transplantation for hairline correction in women is often associated with unnatural appearance due to thicker donor hair from occipital region, as women tend to have finer hair in the frontal part of their natural hairline. Various surgical techniques have been used to revise the hairline with their own complications and limitations. However, LHR used as a nonsurgical method for revising hairline following hair transplantation in women, in a study carried out by Park *et al.*,[97] resulted in subjective improvement in 87.5% of the cases as well as significant reduction in hair diameter. To prevent damage to the transplanted follicle, long-pulsed Nd:YAG laser irradiation with short pulse width (35–36 J/cm^2 and 6ms) was used. LHR can thus be beneficial as an alternative to create fine hair, for revised hairline in women, and other recipient areas requiring fine hair.

Conclusion

Although LHR started as a cosmetic modality, it is fast gaining significance as a therapeutic modality in wide range of dermatological and surgical indications. LHR is safe and well tolerated even in pediatric population. It has reduced the morbidity associated with various chronic and recurrent disorders and thus improved the quality of life of these patients.

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Conflicts of interest

There are no conflicts of interest.

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Figures and Tables

Table 1:

LHR in the treatment of pilonidal sinus disease

	al.[18]		J/cm^2, 3ms,18 mm		months		
2	Badawy *et al.*[17]	15	(III–V) Nd:YAG; 40–50 J/ cm^2,30ms, 10 mm	3–8	12–23 months	No recurrence in LHR group (15) as compared to 7 (/10) in controls	Periprocedural pain and folliculitis
3	Benedetto *et al.*[11].	2	Diode (800nm); 30–48 J/ cm^2, 15–24 ms	2–6	5.5 years	No recurrence	None
4	Conroy *et al.*[10]	14	Alexandrite; 15–30 J/cm^2; 10–40 ms	3–6	12 months	12 recurrence free. 2 of 14 patients declined complete treatment course, one due to pain	Periprocedural pain
5	Ghnnam *et al*[21]	45	Alexandrite; 14–16 J/cm^2; 3ms; 15 mm	4	2±1 years	Recurrence rate of 2.3% after F/U period	—
6	Odili *et al.*[14]	14	Alexandrite; 12–40 J/cm^2, 5–10mm; or ruby 14.5–25 J/cm^2; 1–5 pulses/s	1–10	1–5 years	10/14 recurrence free	Periprocedural pain
7	Oram *et al.*[22]	60	Alexandrite, 14–27 J/cm^2, 3ms, 12–18 mm	2–5	4.8±0.3 years	Eight recurrences, all had only two laser sessions; only two within 2 years post laser	—
8	Koch *et al.*[23]	5	Alexandrite; 18–32 J/cm^2, 5–20ms, 12–15 mm	6–8	4–24 months	No disease exacerbations during F/U and healing of sinuses	Erythema, edema, and blisters in 1 case
		2	Nd:YAG; 20–40 J/cm^2, 40–25ms, 12–15 mm	6			
9	Lindholt-Jensen[20]	41	Nd:YAG; 40 J/cm^2, 3ms, 15 mm	1–9	15.2 months	28 of 37 (4 lost to F/U) patients were symptom- free (75.7%)	Self-limited postprocedural and redness for 1 week
10	Landa *et*	6	Alexandrite; 16–18	3–11	6–11	Recurrence free	None

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IPL = intense pulse light; LHR = laser hair removal; Nd:YAG = neodymium:yttrium aluminum garnet

Figure 1

Laser hair removal for treatment of pilonidal sinus

Reprinted with permission from article ‘Use of lasers for the management of refractory cases of hidradenitis suppurativa and pilonidal sinus’ published in Journal of Cutaneous and Aesthetic Surgery 2012; Volume 5, Issue 3.

Table 2:

LHR in treatment in hidradenitis suppurativa

S/No.	Study (reference)	Patient no.	Laser parameters	Treatment sittings	Follow-up	Outcome	Adverse effects
1	Downs *et al.*[26]	1	Diode 14 J/cm^2; 50ms, 6 mm	4	None	Decreased erythema and tenderness	Pain during treatment
2	Highton *et al.*[25]	17	IPL (420nm); 7–10 J/ cm^2, 30–50 ms	8	12 months	Significant improvement of treated site compared to control and maintained in F/U period	Erythema posttreatment
3	Mahmoud *et al.*[28]	17	Nd:YAG; 40–50 J/cm^2, 20ms, 10mm (skin types I–III); 25–35 J/ cm^2, 35ms, 10mm (skin types IV–VI)	4	2 months	Progressive reduction in disease activity; remission maintained in follow-up period	40% patients experienced periprocedural pain
4	Tierney *et al.*[24]	17	Nd:YAG; 40–50 J/cm^2, 20ms, 10mm (skin types I–III); 25–35 J/ cm^2, 35ms, 10mm (skin types IV–VI)	3	1 month	Statistically significant improvement in HS severity of 65.3% averaged over all body sites treated (LHR + topical antibiotics) compared to control (topical antibiotics) at 3 months	Initial worsening of inflammation
5	Koch *et al.* [23]	1	Alexandrite; 15–22 J/ cm^2, 20ms, 15 mm	6	10 months	Excellent response	—
6	Jain *et al.* [29]	4	Nd:YAG+ CO_2 laser	4–5	3 years	None showed any recurrence	—
7	Xu *et al.* [27]	20	Nd:YAG	2	2 months	Significant improvement of treated site compared to control at 2 months; clinicopathologic correlation between disease activity and	Initial worsening of inflammation

HS = hidradenitis suppurativa; IPL = intense pulse light; LHR = laser hair removal; Nd:YAG = neodymium:yttrium aluminum garnet

Table 3:

LHR in treatment in pseudofolliculitis barbae

			mm			hair growth	
2	Greppi *et al.*[38]	4	Diode; 10 J/cm^2,30ms, 9 mm	7–10	—	Papular lesions resolved. 75–90% hair reduction	Blistering, transient hyper- and hypopigmentation
3	Kauvar *et al.*[35]	10	Diode (810nm); 30–38 J/cm^2, 20ms,9 mm	3	6–8 weeks	>50% reduction in PFB lesions; 51–75% hair reduction in 6/10 patients, >75% in 4/10 patients	Transient perifollicular erythema and crusts
4	Leheta *et al.*[42]	20	Alexandrite; 10–18 J/ cm^2, 3ms, 15 mm	7	12	80% reduction in mean PFB lesion count with Alexandrite, as compared to 50% reduction in mean PFB lesion count with IPL	Perifollicular edema and erythema
5	Nanni *et al.*[37]	10	Alexandrite; 5–8 J/cm^2, 20ms, 12.5 mm	6	4	≥50% reduction in lesion count in 100% of patients,≥75% reduction in 25%	Rare treatment discomfort, transient hyperpigmentation, crusting
6	Koch *et al.*[23]	2	Nd:YAG; 25–35, 40ms,12mm Alexandrite; 18–22 J/ cm^2, 20ms, 12 mm	6	16		—
7	Rogers *et al.*[44]	18	QS Nd:YAG; 2.5 J/cm^2, 10 pulses/s,7 mm	1–2	2	56% mean reduction in PFB lesions in 50% patients	Immediate (one patient) and delayed hypo- and hyperpigmentation, blistering (1 patient), pain, erythema
8	Ross *et al.*[43]	28	Nd:YAG; 50,80, 100 J/ cm^2 50ms, 5	1	3	Mean papule count 1.0 vs. 6.95 in treatment and control (untreated)	Transient perifollicular erythema and

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LHR = laser hair removal; Nd:YAG = neodymium:yttrium aluminum garnet; PFB = pseudofolliculitis barbae

Table 4:

LHR in Becker's nevus and other nevoid conditions

S/No.	Study (reference no.)	Patient no.	Laser parameters	Treatment sittings	Follow-up	Outcome	Adverse effects
1	Choi *et al.* [63]	11	Alexandrite; 20–25 J/cm^2, 3ms, 15 (25 J/cm^2) or 18 (20 J/cm^2	2–12	4–24 months	>75% pigment reduction in 18% of patients, 50–75% pigment reduction in 45% of patients, 25–50% pigment reduction in 36% of patients; decrease in hair density in all patients	Transient hypopigmentation; mild hypertrophic scar in one patient,
2	Downs *et al.*[60]	3	QS Nd:YAG followed by Alexandrite; 1.2–4 J/cm^2	6–7	24 months	Maintained response of 30–80%pigment clearance; 50% hair loss in two/three patients (patient 3 had blond hair not suitable for LHR	None
3	Nanni *et al.*[59]	1	LPRL; 18–22 J/ cm^2, 3ms, 10 mm	3	10 months	90% reduction in hair density and pigmentation	Mild perioperative pain, erythema, crusting
4	Wulkan *et al.*[65]	1	Nd:YAG followed by Alexandrite	6/5	—	Significant reduction in both hypertrichosis and hyperpigmentation	None
5	Koch *et al.* [23]	3	Nd:YAG; 20–45 J/ cm^2, 30–40ms,12–15mm	2–6	19 months	Two patients with mild and one with excellent reduction in hair density Marked	Mild erythema
		2 (nevoid	Alexandrite;	3–4	4	reduction in hair	

IPL = intense pulse light; LHR = laser hair removal;LPRL = long pulsed ruby laser Nd:YAG = neodymium:yttrium aluminum garnet; NMRL = normal mode ruby laser

Table 5:

Laser hair removal in hairy flaps and grafts in oral mucosa

S/No.	Study	Patient no.	Laser parameters	Treatment sittings	Follow-up	Outcome	Adverse effects
1	Conroy *et al.*[73]	1	Alexandrite; 20 J/ cm^2, 20 ms	3	6 months	Significant symptom improvement and no hair regrowth	None
2	Lumley[74]	1	Nd:YAG; 9.5–36.4 J/ cm^2, 10ms, 4–10 mm	4	10 months	Hair free for 6 months, little hair growth after 10 months	None
3	Koch *et al.* [23]	6	Alexandrite; 20–35 J/cm^2, 9–20ms, 12 mm	4–10	9–48 months	Significant symptom improvement, hair free during F/U	None
4	Kaune *et al.*[77]	9	Nd:YAG	—	1–4	Effective hair reduction in 8/9. >90% clearance in 5/9 patients	None
5	Shim *et al.* [75]	5	Alexandrite	—	—	One patient was not treated due to difficult access	—
6	Shields *et al.*[72]	4	LP Alexandrite or Nd:YAG	—	8 weekly until hair removal achieved	Significant improvement in hair removal	—
7	Toft *et al.* [78]	1	Alexandrite, 10 J/ cm^2, N/S, 7 mm	1	2 months	Well tolerated; marked symptom improvement	—

LHR = laser hair removal; Nd:YAG = neodymium:yttrium aluminum garnet