Prognostic Factors and Long-Term Efficacy of Tonsillectomy in 17 Patients with Pustulotic Arthro-Osteitis

Yuji Kan, Yasuyuki Sumikawa, Tokimasa Hida, Saeko Ajiki, Hisashi Uhara

ABSTRACT

In this case study, we aimed to evaluate the disease condition of patients with pustulotic arthro-osteitis (PAO) at 36-month post-tonsillectomy. A retrospective analysis of the cases of 17 patients with PAO who were resistant to initial systemic treatments and underwent tonsillectomy at our hospital in 2006-2016 was conducted. The patients' disease condition at 1-, 24-, and 36-month post-tonsillectomy was assessed by the visual analog scale (VAS) score for osteoarthropathic pain, the disease duration, the area of palmoplantar lesions, and the Palmoplantar Pustular Psoriasis Area Severity Index (ppPASI). In the minimum follow-up of 36-month post-tonsillectomy in 17 patients, the median ppPASI and VAS scores decreased from 12 to 1 and from 80 to 20, respectively. Thirteen patients with ≥70% improvement in their VAS scores maintained the same good condition after ≥36 months, whereas four patients with <70% improvement in their VAS scores did not show remarkable improvement after that time point. Furthermore, we found that the improvement in VAS score was not associated with the disease duration or the patients' pre-tonsillectomy ppPASI values. Tonsillectomy might be an alternative treatment option for patients with PAO. Long-term efficacy against pain can be predicted by evaluating a patient's improvement at 1-month post-tonsillectomy.

Keywords: Prognosis, tonsillectomy, osteitis, visual analog scale

Introduction

Pustulotic arthro-osteitis (PAO) is a rare inflammatory disorder that was first described by Sonozaki et al. [1]. PAO has to be distinguished from some other rheumatic diseases, such as rheumatoid arthritis, ankylosing spondylitis, Reiter's disease, psoriatic arthritis, and synovitis, acne, pustulosis, hyperostosis, and osteitis syndrome. It is distinct by imaging examination, such as magnetic resonance imaging (MRI), extra-articular symptoms, and frequency of human leukocyte antigen [1].

Tonsillectomy is a well-established surgical procedure for treatment-resistant palmoplantar pustulosis (PPP) [2], psoriasis [3], and guttate psoriasis [4]. A Japanese study has shown the efficacy of tonsillectomy for patients with PAO [2]. The reported remission rates of joint pain among patients with PAO were 73% and 83% at 6- and 12-month post-tonsillectomy, respectively [2]. However, the prognostic factors influencing the outcome have not been analyzed. In this case study, we retrospectively investigated the efficacy of tonsillectomy for pain and skin lesions in patients with PAO who were resistant to nonsteroidal anti-inflammatory drugs (NSAIDs), tramadol hydrochloride, and initial systemic therapies. We used the visual analog scale (VAS) score to assess the osteoarthropathic pain of patients with PAO and the area of palmoplantar lesions and Palmoplantar Pustular Psoriasis Area Severity Index (ppPASI) to assess the efficacy of the patients' tonsillectomies [5].

PAO was defined as the condition satisfying all of the following criteria on the first visit: (1) PPP is characterized by aseptic pustules occurring on the palms and soles, (2) joint involvement associated with PPP, and (3) PAO is included in seronegative spondyloarthropathies, which are characterized by joint destruction and negative rheumatoid factor [6].

Statistical analysis was performed using Pearson's χ^2 test and Mann–Whitney U test. A $p<0.05$ was considered significant.

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Case Presentation

We collected the case information of 17 (4 male and 13 female) patients with PAO who were resistant to initial treatments and underwent tonsillectomy at our hospital in 2006–2016 (Table 1). Patients with PAO who were treated with a tonsillectomy with full clinicopathological records (medical interview, physical examination, clinical images/descriptions, and findings) on every visit and imaging study were retrospectively analyzed for 3 years in this case study.

The patients' ages ranged from 42 to 80 (average 58.2 and median 57) years. The affected duration of the PAO disease ranged from 0.1 to 30 (average 4.64 and median 0.8) years. Thirteen patients had a history of exacerbation of skin lesions after tonsillitis. Dental focal infections were treated. Dental metal allergy was not recognized in all the 17 patients. All patients underwent complete tonsillectomy, including the lingual tonsil, pharyngeal (adenoid) tonsil, and palatine or faucial tonsil, after cessation of smoking. Contraindications for tonsillectomy were observed in one patient with mild bleeding postoperatively. Bone–joint involved areas were detected by X-ray or MRI in all the 17 patients.

Over the minimum follow-up of 36-month post-tonsillectomy, the median ppPASI scores of the 17 patients decreased from 12 (range 6-18) to 1 (range 0-2), and the median VAS scores declined from 80 (range 60-100) to 20 (range 10-50).

With regard to the pain of patients with PAO, the VAS score improved ≥75% in 76.5% (13/17) of the patients. The duration required to achieve ≥75% improvement in the VAS score for osteoarthropathic pain was 2 days-36 months (median 24 months). Four patients with <75% improvement of the VAS score showed partial response (Table 1). The duration did not correlate with the effect of tonsillectomy on the VAS score (R^2=0.0379). The percent improvement of VAS score ≥75% of the patients with a history of tonsillitis ranged from 37.5 to 100 (mean and median 80) mm. A history of tonsillitis did not correlate with the effect of tonsillectomy on the VAS score.

Among the 17 patients whose VAS scores were evaluable at 1-month post-tonsillectomy, 13 patients with ≥70% improvement in the VAS score maintained the same good condition at ≥24-month post-tonsillectomy, whereas 4 patients with <70% improvement in the VAS score did not show remarkable improvement after that time point (p<0.01) (Figure 1).

Discussion

Evidence on the effectivity of tonsillectomy for PAO is scarce. One suspected reason is based on a close relationship between the exacerbation of these disorders and infectious tonsillitis [7]. Throat infection with β-hemolytic streptococci is well known to be an external trigger associated with the initiation and acute exacerbation of psoriasis [3], and α-streptococci are likely to play a role in PPP [8]. Migration of streptococcal-specific cutaneous lymphocyte-associated antigen-positive T cells from the tonsil into the skin and joints may occur [6]. Tonsillectomy could contribute to the beneficial clinical effect by removing bacterial infection, resulting in abnormal immune activity [9]. The treatment options for PAO are NSAIDs, corticosteroids, antibiotics, colchicine, methotrexate, and cyclosporine. However, the effectiveness of these treatments is limited. Colchicine, methotrexate, and cyclosporine have an off-label use in our country. The efficacy of antibodies to tumor necrosis factor-α for PAO has also been shown [10]. However, biological agents are expensive and usually require continuous administration for disease control. Thus, additional treatment options for PAO are desired.

Table 1. Summary of the 17 patients with PAO. The 17 patients' ppPASI value and VAS score before and after tonsillectomy

Patient NO.	Sex/ Age	Disease duration (year)	Bone-joint involved areas (before TE)	Recurrent tonsillitis	ppPASI (before TE)	ppPASI (after TE)	VAS (mm) (before TE)	VAS (mm) (after TE)			Percent improvement of VAS (after 24 months)	Systmeic treatment (before TE)	Systmeic treatment (after TE)	Bone-joint involved areas (after TE)
								1M	24M	36M				
1	F/52s	3	st, sh	+	12	2	80	20	20	20	75	NSAID, TRM	NSAID	sh
2	F/62s	1.5	st	-	12	0	80	20	20	10	75	NSAID, TRM	none	none
3	F/54s	0.8	st, ba, sac	-	12	0	90	20	20	20	77.8	NSAID, TRM	none	none
4	F/80s	3	st	+	12	1	90	20	20	10	77.8	NSAID, TRM	none	none
5	F/80s	3	st, elb, wr	+	12	2	100	20	20	20	80	NSAID, TRM	none	none
6	F/60s	30	st, wr	+	18	1	100	20	20	20	80	NSAID, TRM	none	none
7	F/52s	0.4	st, ba, sh	+	18	1	100	20	20	10	80	NSAID, TRM, MTX	none	none
8	F/57s	0.1	st, ba, sh	+	6	1	100	30	20	20	80	NSAID, TRM	NSAID	ba
9	F/54s	22	st	+	12	1	60	10	10	10	83.3	NSAID, MTX	none	none
10	M/63s	10	st, knee	+	12	0	70	10	10	10	85.7	NSAID	none	none
11	F/67s	3	st, ba	+	6	0	70	10	10	10	85.7	NSAID	none	none
12	M/42s	0.1	st, ba	+	12	0	80	10	10	10	85.7	NSAID	none	none
13	M/45s	0.7	st, ba, sh	+	12	0	80	10	10	10	85.7	NSAID	none	none
14	F/58s	0.2	st	-	12	1	100	40	70	70	30	NSAID, TRM	NSAID, TRM	st
15	F/60s	0.2	st, wr, sac, ank	+	12	2	80	50	50	40	37.5	NSAID, TRM	NSAID, TRM	sac
16	F/54s	0.2	st, sac	-	12	2	80	50	50	50	37.5	NSAID, TRM, CyA, MTX	adalimumab	st, sac
17	M/49s	0.7	st, sh	+	12	0	80	80	50	40	37.5	NSAID	NSAID, TRM	st, sh

MRI revealed abnormal focal increases of radiotracer uptake in these joints of the patient. TE: tonsillectomy; st: sternum; ba: back; sh: shoulder; wr: wrist; sac: sacroiliac joint; elb: elbow; ank: ankle; NSAID: nonsteroidal anti-inflammatory drug; MTX: methotrexate; CyA: cyclosporine A; TRM: tramadol hydrochloride.

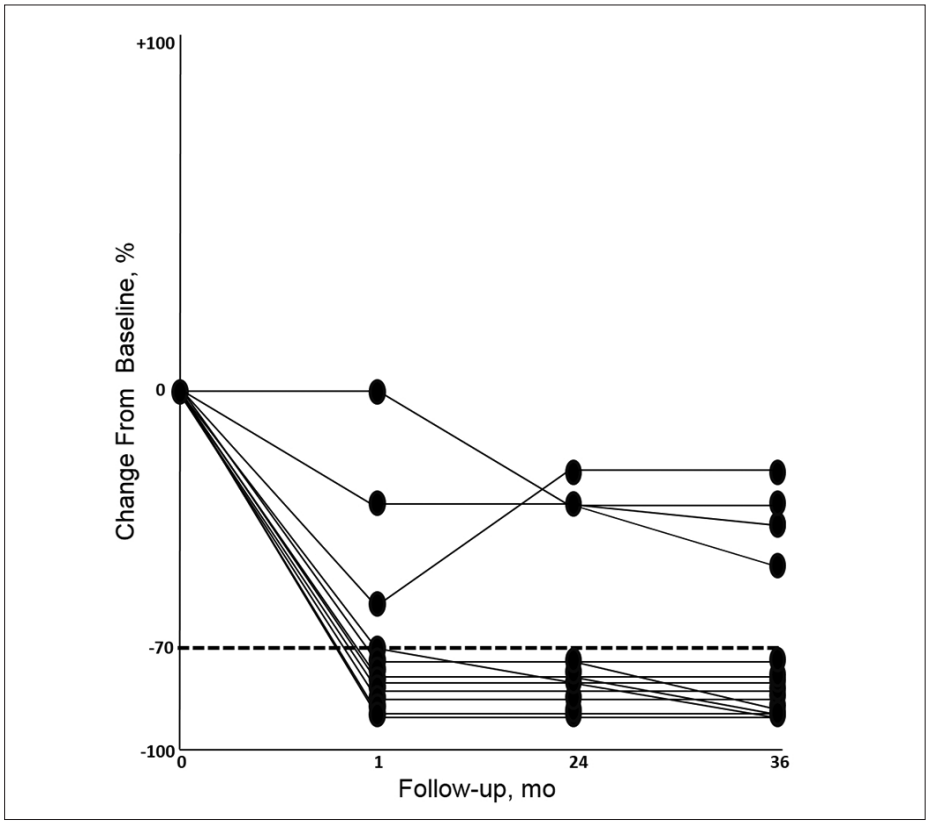

Figure 1. Response rate of VAS score before and after tonsillectomy in 17 patients. Thirteen patients with ≥70% improvement in their VAS scores maintained the same good condition at ≥36-month post-tonsillectomy, whereas four patients with <70% improvement in their VAS scores did not show remarkable improvement after that time point ($p<0.01$).

First, our present analyses demonstrated that the clinical effect of tonsillectomy was not influenced by a history of exacerbated symptoms related to tonsillitis and disease duration. Of the 13 patients with a history of recurrent tonsillitis, 11 patients showed ≥75% improvement in the VAS score (Table 1). From these facts in PAO, we suggested that tonsillectomy is usually recommended for patients with a history of recurrent tonsillitis associated with severe pain regardless of disease duration.

Second, our present analyses revealed the rapid and long-term efficacy of tonsillectomy in three-quarters of a series of Japanese patients with PAO. Over the minimum follow-up of 36 months, the patients' median ppPASI and VAS scores decreased from 12 to 1 and from 80 to 20, respectively. Thus, an improvement of arthralgia after tonsillectomy could potentially reduce the necessary dose of treatment agents or allow the use of a less potent drug for disease control.

Our present findings may possibly be the result of a spontaneous improvement of some of the patients' conditions. The improvements in the symptoms of four patients (no. 14-17) were not remarkable at 1-month post-tonsillectomy. However, the clinical findings of 13 patients whose symptoms were evaluable after 1-month post-tonsillectomy showed rapid clinical effects. We speculated that treatment should be changed if arthralgia did not improve at 1-month post-tonsillectomy. If pain decreased within 1 month, we speculated that the effect of tonsillectomy was more likely to last. Thus, a tonsillectomy could have clinical benefits for the majority of patients with PAO. Further investigation is needed to determine whether a history of tonsillitis is a factor on whether tonsillectomy should be performed in patients with PAO.

Informed Consent: Written informed consent was obtained from the patient who participated in this study.

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