

# Evaluation of the Involvement of the Tempromandibular Joint in Patients with Psoriasis using Computed Tomography for Detection of Psoriatic Arthritis Changes.

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## ABSTRACT

**Background:** Tempromandibular disorders is a collective term, embracing several clinical problems involving the muscles of mastication, temporomandibular joint (TMJ), or both. Tempromandibular disorders is a symptom complex rather than a single condition. TMDs form a cluster of related disorders with common symptoms which include localized pain, limited or asymmetric movement, and clicks or grating on opening. Psoriatic arthritis is a chronic inflammatory arthropathy that affects patients with psoriasis. The clinical findings for Tempromandibular PSA are pain, tenderness, limitation of movement, joint stiffness, clicking as the jaw is opened or closed, difficulty in opening the mouth, locking of the jaw, and crepitations. These findings are essentially the same as for myofascial pain/dysfunction<sup>(3)</sup>. The objective of the study were to determine the extent of tempromandibular joint involvement in patients with psoriatic arthritis and to evaluate the correlation between clinical findings and radiographic finding.

**Materials and method:** In this study 98 patients were selected, 50 male and 48 female, their age ranged between (18-68) years. They were collected at Al-Yarmook teaching hospital/department of. They were diagnosed as having psoriatic arthritis by a dermatologist according to (Moll and Wright diagnostic criteria 1973)<sup>(41)</sup>. These patients were subjected to rheumatoid factor test RF to exclude the presence of rheumatoid arthritic disease, then the patients were exposed to CT scanning for the Tempromandibular joint in Al-Yarmook teaching hospital for screening the involvement of TMJ with psoriatic arthritis by the presence of any radiographic changes such as erosion, flattening, osteophyte and sclerosis in the condylar head.

**Results:** The result of the study showed that the mean age of psoriatic arthritic patients in TMJ was (44.2) years, and female percentage was (48.4%) and male was (51.6%). Psoriatic arthritis in TMJ showed high significance in the unilateral side complaining (100%) and it was significant in the positive family history (54.8%), and non significant in the right/left ratio (41.9%). Oligo type was found in twenty six patients (83.9%) with significant p-value. Clinically: all symptoms including clicking, tenderness and tempromandibular joint pain were highly significant, limitation showed (54.8%), TMJ pain showed (64.5%) and tenderness showed (54.8%). Radiologically: CT scan showed sensitivity for erosion in TMJ (54.8%), for osteophyte (32.3%), for condylar flattening (16.1%) and for sclerosis (9.7%) while specificity for all were (100%). Association between clinical and radiological changes showed non significant correlation.

**Conclusions:** Psoriatic arthritis of TMJ is unilateral (oligo type). Female/ male ratio is about 1:1. About 50% of patients have limitation in mouth opening. Most of the patients have positive family history. Duration of the disease is related to the development of psoriatic arthritis in TMJ. Plaque psoriasis is the most associated type with the psoriatic arthritis in TMJ. Most of patients with psoriatic arthritis show psoriatic nail changes. The most radiographic findings found in patients with psoriatic arthritis was erosion in the condylar head. There is association between clinical and radiologic findings for psoriatic arthritis in TMJ.

(Keywords: Tempromandibular joint, Tempromandibular disorders, psoriatic arthritis, Computed tomography).

## تقييم اصابة المفصل الفكي الصدغي عند مرضى الصدفية باستعمال التصوير المقطعي المحوسب للكشف عن

### التغيرات المفصليّة

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المستخلص:

### خلفية البحث

اضطرابات المفصل الفكي الصدغي تشير الى مصطلح مركب يحتوي على عدة حالات تتضمن المفصل الصدغي، التركيبات المحيطة او كلاهما. اضطرابات المفصل الفكي الصدغي هي مجموعة اعراض معقدة اكثر من كونها حالة معينة واحدة، ويعتقد انها تنتج من عدة عوامل مثل: العوامل الجينية، التنموية والايضية وانها تكون مجموعة من الحالات المرتبطة مع اعراض شائعة تتضمن الم موضعي، حركة متحددة او غير متناظرة، قلة او تشابك اثناء الفتح. الروماتيزم الصدفي او التهاب المفصل في الصدفية هو التهاب المفاصل المزمن الذي يؤثر على المرضى المصابين بداء الصدفية. الروماتيزم الصدفي الاكثر شيوعا هو السلبي المصل الاحادي الجانب الموجود عند المرضى المصابين بداء الصدفية لذلك هو يحصل اكثر عند المرضى ذوي النسيج نوع كريات الدم البيضاء المناعية الانسانية ب 27.

النتائج السريرية لمرض الروماتيزم الصدفي الذي يصيب المفصل الفكي الصدغي هي الم، مضمض، تحدد الحركة، تصلب المفصل، قلة عند فتح او غلق الفك، صعوبة عند فتح الفم ثقيل المفصل وفرقة. هذه النتائج السريرية تشبه الى حد ما تلك الموجودة في الالم المرتبط بخلل الاداء المرتبط باللفافة العضلية

### اهداف البحث

لتحديد مدى شمول المفصل الفكي الصدغي لدى المرضى المصابين بالتهاب المفصل في الصدفية.

في هذه الدراسة تم اخذ ثمانية وتسعون مريضاً، خمسون ذكراً وثمانية واربعون امرأة اعمارهم كانت بين (١٨-٦٨) سنة من مستشفى اليرموك التعليمي اقسام الامراض الجلدية من الفترة (تشرين الثاني ٢٠١٤- ايار ٢٠١٥). شخصوا من قبل اخصائي الجلدية بانهم مصابون بالتهاب المفصل في الصدفية استنادا الى معايير خاصة.

هؤلاء المرضى خضعوا لتحليل العامل الروماتويدي لاستبعاد وجود مرض التهاب المفصل الروماتويدي، ثم خضعوا للتصوير المقطعي المحوسب للمفصل الفكي الصدغي في مستشفى اليرموك التعليمي لتوضيح شمول المفصل بمرض التهاب المفصل في الصدفية بوجود اي تغيرات في التصوير الشعاعي مثل التآكل، التسطح، نابذة عظمية والتصلب في الرأس اللقيمي.

النتائج

نتائج الدراسة اظهرت ان متوسط اعمار المصابين بالتهاب المفصل في الصدفية في المفصل الفكي الصدغي هو (٤٤,٢ سنة) ونسبة الاناث كانت (٤٨,٤) ونسبة الذكور كانت (٥١,٦). التهاب المفصل في الصدفية في المفصل الفكي الصدغي اظهر توافق احصائي عالي في التأثير وحيد الجانب (١٠٠٪) وتوافق احصائي في التاريخ الطبي العائلي مع المرض (٥٤,٨٪) ولا يوجد توافق في نسبة الجانبين الايمن واليسر (٤١,٩٪).

النوع ذات التأثير الاحادي الجانب وجد عند ستة وعشرون مريضاً (٨٣,٩٪) مع وجود توافق احصائي لجميع الاعراض المتضمنة القلقة، المضض والالم في المفصل الفكي الصدغي كانت عالية التوافق الاحصائي، التحدد ظهر بنسبة (٦٤,٥٪) والمضض بنسبة (٥٤,٨٪). النتائج الشعاعية: التصوير المقطعي المحوسب اظهر حساسية للتآكل في المفصل الفكي الصدغي بنسبة (٥٤,٨٪) ولنابذة العظمية بنسبة (٣٢,٣٪) ولتسطح الراس اللقيمي بنسبة (١٦,١٪) ولتصلب بنسبة (٩,٧٪) فيما كانت نسبة النوعية لجميع النتائج هي (١٠٠٪). العلاقة بين التغيرات السريرية ونتائج التصوير الشعاعي اظهرت عدم وجود توافق احصائي فيما بينهما.

الاستنتاجات

التهاب المفصل في الصدفية في المفصل الفكي الصدغي هو من النوع ذات التأثير الاحادي الجانب. نسبة الذكور الى الاناث هي ١:١. ما يقارب ٥٠٪ من المرضى لديهم تحديد في القدرة على فتح الفم. اغلبية المرضى كان لديهم تاريخ طبي عائلي مع المرض. مدة مرض لها علاقة مع تطور التهاب المفصل في الصدفية في المفصل الفكي الصدغي. الصدفية اللويحية هي اكثر انواع الصدفية ارتباطاً مع التهاب المفصل الصدغي في المفصل الفكي الصدغي. معظم المرضى كان لديهم تغيرات الاظافر الصدفية. معظم نتائج التصوير الشعاعي للمرضى اظهرت وجود تآكل في الراس اللقيمي. هناك علاقة بين النتائج السريرية والشعاعية لالتهاب المفصل في الصدفية في المفصل الفكي الصدغي.

**INTRODUCTION**

Psoriasis is a chronic, autoimmune disease that appears on the skin. It is not contagious, yet is the most common autoimmune disease in the United States. Psoriasis has been linked to other serious health conditions, such as cardiovascular disease and depression. About 30 percent of people with psoriasis develop psoriatic arthritis, which causes pain, stiffness and swelling in and around the joints<sup>(1)</sup>.

Psoriatic arthritis can develop at any age. Genes, the immune system, and environmental factors are all believed to play a role in the onset of the disease. Arthritis is not correlated with the extent of skin disease<sup>(2)</sup>. psoriatic arthritis result in destructive arthritis in which the inflammatory process leads to bony erosion and loss of joint architecture

Psoriatic arthritis (PsA) has historically been considered a milder rheumatic disease not yielding significant clinical damage. However, recent studies have shown that PsA can be deforming and debilitating and that joint damage can be severe<sup>(5)</sup>. Traditionally, joint damage has been recorded using plain radiographs. Characteristic radiographic features of PsA include joint erosions, joint space narrowing, bony proliferation including periarticular and shaft periostitis, osteolysis including "pencil in cup" deformity and acro-osteolysis, ankylosis, spur formation, and spondylitis<sup>(4)</sup>.

In 80% of patients, psoriasis usually precedes the development of arthritis. Treatment is by using anti-inflammatory agents, anti-malarials, and adding methotrexate<sup>(15)</sup>. Treating the skin alone seems

to have little impact on joint disease, and the relationship between skin and joints is still unclear. Psoriatic arthritis of the temporomandibular joint (TMJ) was described in 1965, and in the twenty cases reported the TMJ affection has been part of polyarthritis in patients who have suffered from cutaneous psoriasis for years. Clinically, the temporomandibular joint has presented symptoms of chronic arthritis (pain, TMJ tenderness and restricted movement). Radiologic imaging has revealed abnormalities in condyle position, erosion, Osteoporosis<sup>(6)</sup>.

**SUBJECT, MATERIALS AND METHOD**

Patients were diagnosed as having psoriasis by the dermatologist, then Moll and Wright diagnostic criteria were applied to these patients for diagnosis of psoriatic arthritis. If two of the first four criteria and the fifth one were achieved the patient diagnosed as having PsA. an inflammatory arthritis (peripheral arthritis and/or sacroiliitis or spondylitis).

- The presence of psoriasis.
- Nail involvement such as pitting and separation from the nail bed (onycholysis), as well as yellow-pink discoloration (the oil-drop sign).
- Sausage digits (dactylitis).
- The (usual) absence of serological tests for rheumatoid factor<sup>(11)</sup>.

**Clinical examination:** The clinical examination started with examination of psoriatic skin lesions, then examination of nails for psoriatic nail changes.

**TMJ pain on palpation:**

The tip of the index finger was placed over the

lateral aspects of both joint area and slight pressure was applied, pain or tenderness was recorded in a static position or during opening and closing of the mouth. The same procedure was repeated to examine the posterior aspect of the TMJ via external auditory meatus using the index and middle fingers, pain on movement or tenderness was recorded whenever palpation resulted in reflex or the patient reported a subject discomfort<sup>(13)</sup>. Computed tomography scans were carried on Philips Brilliance CT. Bilateral tempromandibular joint CTscans were obtained for all 98 patients. All CT scans were evaluated in details by Radiologist. Each condyle was evaluated for changes like erosion, flattening, osteophyte formation and sclerosis. The clinical data then was correlated with the CT scan findings for each joint and subjected to statistical evaluation.

## RESULT

The result of the study showed that the mean age of psoriatic arthritic patients in TMJ was (44.2) years, and female percentage (48.4%) and male (51.6%). Psoriatic arthritis in TMJ showed highly significant in the unilateral side complaining (100%) and its significant in the positive family history (54.8%) and non significant the right/left ratio (41.9%). Oligo type was founded in twenty six patients (83.9%) with significant p-value, clinically: all symptoms including clicking, tenderness and tempromandibular joint pain were highly significant, limitation showed (54.8%), TMJ pain showed (64.5%) and tenderness showed (54.8%). radiologically: CT scan showed sensitivity for erosion in TMJ (54.8%), for osteophyte (32.3%), for condylar flattening (16.1%) and for sclerosis (9.7%) while specificity for all were (100%). Association between clinical and radiological changes showed non significant correlation

**Table (1) :Description of patient's age and statistical analysis**

		<i>Psoariatic TMJ</i>		<i>Psoariatic arthritis</i>		<i>P value</i>
		<i>No</i>	<i>%</i>	<i>No</i>	<i>%</i>	
Age (years)	<30	6	19.4	7	10.4	0.645
	30---39	7	22.6	17	25.4	
	40---49	6	19.4	17	25.4	
	=>50	12	38.7	26	38.8	
Mean±SD (Range)		44.2±13.3 (18-68)		44.5±11.4 (19-61)		
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**Figure (1) :The clinical presentation**

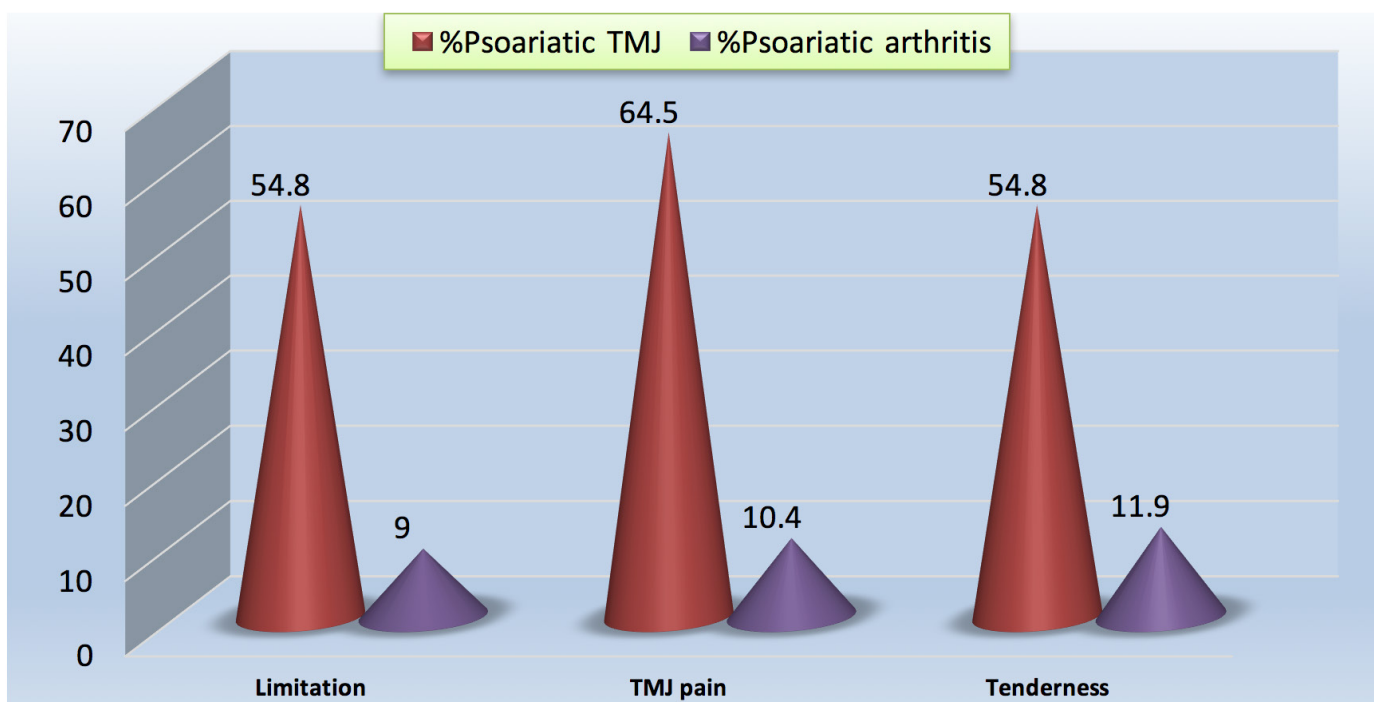


Figure (2) :The percentage of type and associated features.

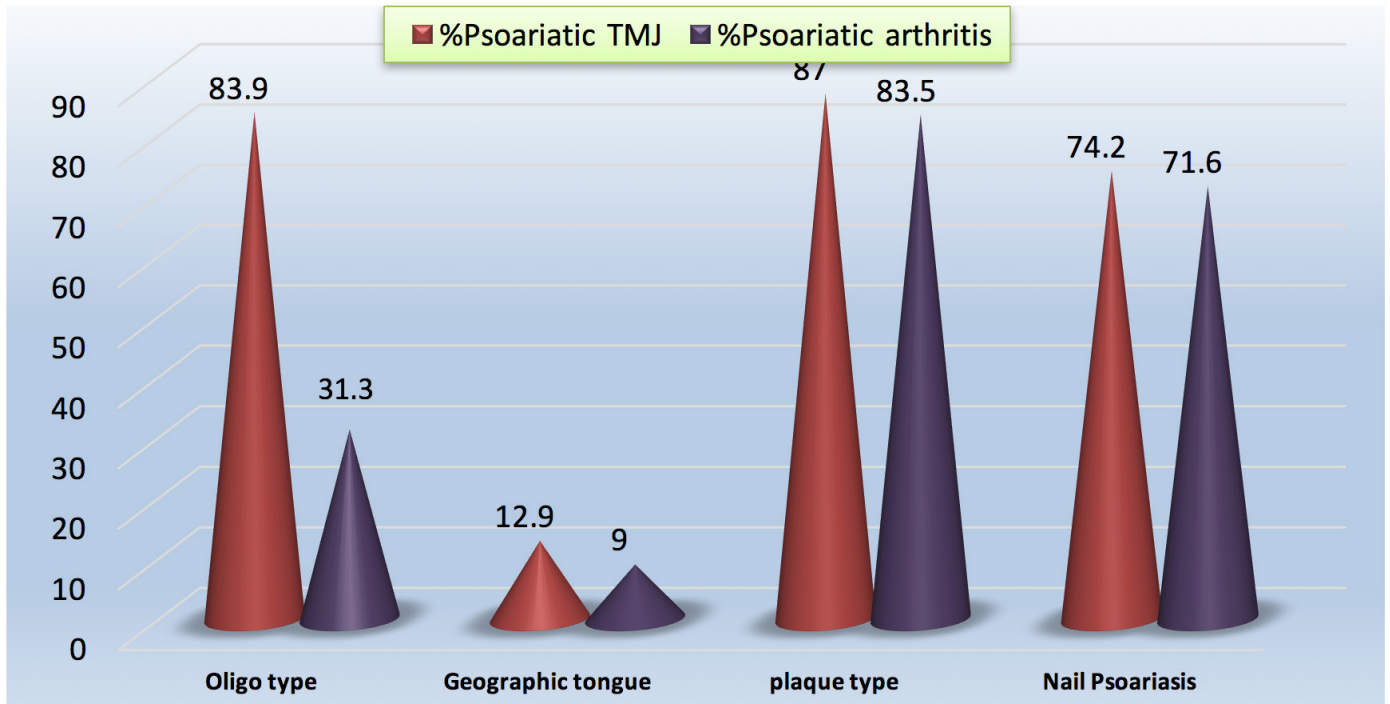


Table (2) :The radiological findings of CT.

CT findings		Psoariatic TMJ	Psoariatic arthritis
		No	No
Erosion	Yes	17	-
	No	14	67
Osteophyte	Yes	10	-
	No	21	67
Flattening	Yes	5	-
	No	26	67
Sclerosis	Yes	3	-
	No	28	67

\*Significant difference in proportions using Pearson Chi-square test at 0.05 level

Association between type of psoriatic arthritis and radiological changes.

CT findings		Oligo		Poly		P value
		No	%	No	%	
Erosion	Yes	14	53.8	3	60.0	0.800
	No	12	46.2	2	40.0	
Osteophyte	Yes	7	26.9	3	60.0	0.147
	No	19	73.1	2	40.0	
Flattening	Yes	5	19.2	-	-	-
	No	21	80.8	5	100.0	
Sclerosis	Yes	3	11.5	-	-	-
	No	23	88.5	5	100.0	

\*Significant difference in proportions using Pearson Chi-square test at 0.05 level

DISCUSSION

In our study we found that the mean age of psoriatic arthritis in TMJ was (44.2), and for control group (44.5) which is very close to the group of

**Wilson**<sup>(8)</sup>. with mean age(43.3),while **Kononen**<sup>(7)</sup> found that the mean age was (51) for both arthritic group and control group ,and **Green**<sup>(9)</sup> found the mean age was (46.08). Sex distribution in our study showed that male (50.7%) and female (49.3%) approximately the same to other studies like **Wilson** in 50% for each one. Other study by **Kononen** showed that male (57.2%) and female (42.8%). While other study by **Green** showed sex distribution (1.2:1) very close to our study.In the view of 43 cases of psoriatic arthritis involving TMJ, there is a male predilection (24:19) and the average age of onset is 43.3. TMJ lesions could occur before, during , or after other joints involvement. **Zhi** <sup>(10)</sup>found the most common clinical findings are pain in the TMJ region (27/43). TMJ tenderness to palpation (22/43), and limited mouth opening was (21/43). The unilateral involvement of TMJ in patients with psoriatic arthritis is more common than bilateral involvement (5:3),these features in agreement with the findings of **Rasmussen and Bakke**<sup>(14)</sup>.Moreover , some clinical studies reported that muscle tenderness on palpation and joint sounds were the most frequent symptoms in TMJ, while restricted mouth opening was not prominent in psoriatic arthritis patients. It could be inferred that the symptoms of psoriatic arthritis affecting the TMJ are nonspecific. While in our study All patients examined clinically and it's highly significant in psoriatic arthritis in TMJ for limitation, TMJ pain and tenderness. Limitation showed (54.8%), TMJ pain showed (64.5%) and tenderness showed (54.8%),very close to the result obtained by **Zhi**. In our study Psoriatic arthritis in TMJ showed highly significant in the unilateral side complaining (100%) and its significant in the positive family history (54.8%) and non significant in the right/left ratio (41.9%). The difference in the studies between our study and (**Zhi** was only the percentages in side complaining, this may be due to the variance in the sample size and the race of affected population. **Wilson et al, 2009** found plaque type with (79%) followed by guttate type , similar to our study in which we found plaque type (87%) followed by guttate type.

Among previous studies **Zhi** found erosion is the most common radiographic changes in psoriatic arthritis in patients with TMJ involvement (37/63) about(58%), which is in accordance with radiologic findings of **Lundberg**<sup>(12)</sup> Other radiographic findings such as bony proliferation (22/63) about (44%), condylar flattening ( 8/63) about (12%) and sclerosis (6/63) about (9.5%), are also typical changes in TMJs of psoriatic arthritis patients. This result seems close to the result obtained in our study that CT scan

showed sensitivity for erosion in TMJ (54.8%), for osteophyte (32.3%), for condylar flattening (16.1%) and for sclerosis (9.7%) while specificity for all were (100%).The radiographic sign score did not correlate significantly with the duration, extent, or severity of PA **Kononen**. The Radiographic score correlated with the subjective symptoms score ( $p < 0.01$ ), and one of the variables of , osteophytes, correlated with pain in the TMJ experienced at the onset of subjective symptoms of craniomandibular disorders ( $p < 0.01$ ). The radiographic score , and especially erosions in the condyle, correlated with the clinical dysfunction score.

## CONCLUSIONS

- Psoriatic arthritis of TMJ is unilateral (oligo type).
- Female/ male ratio is about 1:1.
- About 50% of patients have limitation in mouth opening.
- Most of the patients have positive family history.
- Duration of the disease is related to the development of psoriatic arthritis in TMJ.
- Plaque psoriasis is the most associated type with the psoriatic arthritis in TMJ.
- Most of patients with psoriatic arthritis show psoriatic nail changes.
- The most radiographic findings found in patients with psoritic arthritis was erosion in the condylar head.
- There is association between clinical and radiologic findings for psoriatic arthritis in TMJ.

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