

Prospective Clinical Trial Comparing Lingualized Occlusion to Balanced Occlusion in Complete dentures: Case Report

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الخلاصة

الأهداف: تهدف الدراسة الى مقارنة رضا المريض مع اثنين من مفاهيم الأطباق لتصنيع الطقم الكامل (ترتيب الأسنان للطقم بإطباق التوازن و الإطباق اللساني) وفقا لاستبيان رضا المريض طقم الأسنان (DPSQ). **المواد وطرائق البحث:** تم اختيار ثلاثة مرضى أردت تماما ولديه طقم كامل سابق غير مريح. لكل مريض، تم تصنيع طقم كامل علوي وسفلي عدد اثنين، واحدة مع متوازنة والأخرى مع إطباق لساني، ثم قارن بين الآثار والنتيجة بعد شهرين والتي تم الاعتماد على استبيان رضا المريض (DPSQ). والمتابعة للمرضى مستمرة قد تصل إلى سنة كاملة. **النتائج:** أظهرت النتائج رضا المريض وقدرة على النطق والمضغ للطعام بنسبة 66.667% في أطقم كاملة مع إطباق لساني في ما يتعلق مع غيرها من العوامل التي تؤثر على كفاءة سريري لطقم أسنان كامل. **الاستنتاجات:** تقرير هذه الحالة السريرية استنتجت أن حالة إطباق الأسنان اللساني للطقم الكامل فيما يزيد من الارتياح، والقدرة على مضغ الطعام والراحة كذلك أن الطقم الكامل ذو إطباق متوازن وأكثر استقرارا في فم المريض وأكثر جمالية

ABSTRACT

Aims: The purpose of this study was to compare patient's satisfaction with two concepts of occlusion for complete denture construction (balanced and lingualized teeth arranging dentures) according to Denture patient satisfaction questionnaire (DPSQ). **Materials And Methods:** Three completely edentulous patients were selected with uncomfortable previous prosthesis. For each patient, two sets of complete dentures were constructed, one with balanced and the other with lingualized occlusion, then compare the effects and the result after two months which depended on (Denture patient satisfaction questionnaire (DPSQ). Follow up the patients was continued up to one year. **Results:** Patient satisfactions, speaking ability and jawing ability showed 66.667% of complete dentures with lingualized occlusion in relation to the other factors affecting clinical efficiency of complete dentures. **Conclusions:** Case report concluded that the lingualized occlusion dentures have more satisfaction, chewing ability and comfort while the balanced occlusion dentures are more stable in their place and more esthetic.

Key words: Lingualized occlusion, Balanced occlusion, Comfort of patient.

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INTRODUCTION

Occlusion has been described as the most important subject in all branches of dentistry, and for good reason, because the way the teeth come together, and function together, is as important to most of us now as it was to our intimates, who lived on diets much more difficult to cope with⁽¹⁾.

Complete dentures can be produced with different types of occlusal forms. There is some evidence to suggest that it may be advantageous to provide complete dentures with cusped posterior teeth⁽²⁻⁴⁾.

There are many philosophies concerning the most appropriate posterior occlusal forms for conventional complete maxillary

and mandibular dentures. Studies comparing various types of complete denture teeth have been conducted for years and have explored outcomes such as masticatory efficiency, occlusal force, and patient preference⁽⁵⁾.

A high level of patient satisfaction, when fabricating complete dentures, should be the primary goal in the treatment of edentulous subject and the most important goals of denture fabrication is the restoration of masticatory function. The performance of the denture is largely determined by the degree of retention, stability, and support^(6,7).

MATERIALS AND METHODS

Three completely edentulous patients were attending dental clinic for prosthodontic treatment (University of Mosul, College of Dentistry), and selected to made a study on different occlusal form of complete denture construction. The patients were selected with previous wearing denture for about five years, patients with severe resorption residual ridge and Class II and class III ridge relation were excluded, no sex preferences, age between 60-70 years, systemically controlled.

The patient's medical and dental history were evaluated with extra and intra

orally examination. For each patient, two sets of maxillary and mandibular complete denture were constructed, one with balanced articulation and the other with lingualized occlusion and two sets of primary impression by irreversible hydrocolloid alginate material and final impression by light body silicone ORMAMAX Polysiloxane (Condensation Rubber Base Light Liquid) were taken by using one selected stock tray and one custom tray. Bio-Art articulator (model 4000) was used with its face bow which depends on Frankfort plane⁽⁷⁻⁹⁾ (Figure 1).

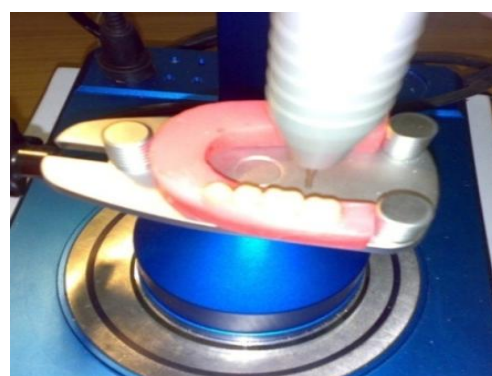


Figure (1): Bio-Art Face bow recorded on patient.

After the construction of record base using cold cure acrylic resin (Major Repair 2 ,Major Prodotti Dentari S.P.A., ITALY). Bite rims and occlusal planes were recorded by using fox bite (for upper occlusal plane parallel to inter papillary line anteriorly and parallel to ala-tragus line posteriorly, while for lower occlusal plane were made with the level of the lower lip anteriorly and with approximately two

thirds of retro molar pad posteriorly). The vertical dimension was adjusted and gets the relation of the upper arch to the cranium⁽⁷⁻⁹⁾.

Horizontal jaw relation was recorded by neutral zone method (taking an impression to the cheeks, lips, and tongue, the teeth were arranged in the space between the cheek and lips from one side and the tongue in the other side)⁽⁷⁻⁹⁾ Protrusive and lateral mount were recorded (Figure 2).



Figure (2): Arrangement of teeth according to neutral zone registration on articulator

For each patient, two sets of teeth were selected with the same size, shade and mold (Acry rock type teeth). The teeth were

arranged according to the basic principle of balanced occlusion^(7,8) for complete dentures constructed with balance concept, and the

other set was done according to the basic principle of lingualized concept occlusion, and depending on the neutral zone⁽¹⁰⁾.

The occlusal form of the Acry rock teeth were modified by using round bur

size (0.25) in straight hand piece attached to the milling machine. This done by arranging the mandibular posterior teeth on a hard wax in a horse shoe shape in zero plane (Figure 3).



Figure (3): Arrangement of teeth on hard horse shoe shaped wax preparing for modification in milling machine

The occlusal morphology of the mandibular teeth were adjusted which means some openings of the occlusal fossa and reduction of the marginal ridges as the teeth are being

interdigitated during the arrangement to achieve good contacts in maximum intercuspation⁽¹⁰⁾ (Figure 4).

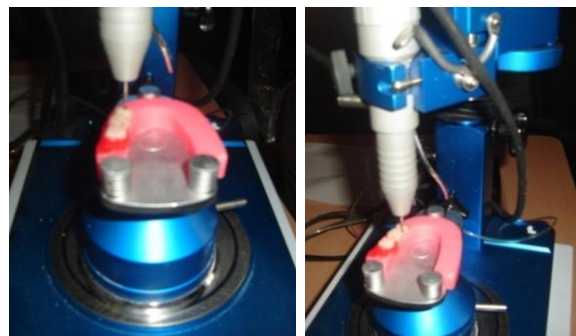


Figure (4): Modification of teeth by milling machine for lingualized occlusion.

The complete denture artificial teeth were arranged by two types of occlusal concepts. The complete dentures with lingualized occlusion were arranged as follows: the functional maxillary lingual cusps of the posterior teeth were set in the central groove of the mandibular posterior teeth in lateral and protrusive excursions. The maxillary buccal cusps were elevated and had no contact with the mandibular buccal cusps. During the lateral movement, contact only occurred on the working side between the lingual cusps of the maxillary and mandibular posterior teeth; on the balancing side there was contact between the lingual cusps of the maxillary denture and the lingual inner curve of the buccal cusps of the mandibular denture. Protrusive balanced contacts oc-

curred between the maxillary lingual cusps and the mandibular posteriors⁽¹⁰⁾

The complete dentures with balanced occlusion were arranged as follows: the functional maxillary lingual cusps of posterior teeth were set in the central groove of the mandibular teeth, and the maxillary buccal cusps were kept in contact with the mandibular buccal cusps. The buccal cusps and the lingual cusps were in articulation and functional in the bilateral and protrusive excursions^(7, 8).

After try-in the prosthesis in patient mouth and correct the fault in arrangement. The laboratory procedure ended from flasking, packing, curing, finishing and polishing of the denture, a blind trail treatment was executed.

Finally, two sets of complete dentures were placed in patient's mouth (Figure 5)



Figure (5): Dentures in patients mouth

First one with balanced and the other lingualized. Follow up of the patients was continued for one year (12 visits). Each patient was instructed to wear each denture and to answer Denture patient satisfaction questionnaire (DPSQ)⁽¹⁰⁾, after each period of time (two weeks R1, one month R2, and after two month R3).

Denture patient satisfaction questionnaire (DPSQ)⁽¹⁰⁾:

1. Are you satisfied with your dentures?
2. Are you satisfied with the appearance of your dentures?
3. Are you satisfied with how well your upper denture stays in place?
4. Are you satisfied with how well your lower denture stays in place?
5. Are you satisfied with how well you chew food with your denture?

6. Are you satisfied with how well you speak with your dentures?
7. Are you satisfied with the comfort of your upper denture?
8. Are you satisfied with the comfort of your lower denture?
9. How well other people (such as wife, housebound, children, etc.) like your denture

RESULTS

The answers of Denture patient satisfaction questionnaire (DPSQ) after placement of each set of complete maxillary and mandibular dentures after two weeks R1, one month R2, and 2 months R3 were statistically analyzed. The percentages of patients' satisfaction with two sets of complete denture were listed in (Tables 1 and 2).

Table (1): Distribution of the response to "patient denture satisfaction questionnaire" for lingualized denture.

Number/ Question		Totally satisfied		Fairly satisfied		Fairly dissatisfied		Totally dissatisfied	
		No.	%	No.	%	No.	%	No.	%
1. Are you satisfied with your dentures?	R1	0	0	2	66.667	1	33.334	0	0
	R2	2	66.667	1	33.334	0	0	0	0
	R3	2	66.667	1	33.334	0	0	0	0
2. Are you satisfied with the appearance of your denture?	R1	0	0	1	33.334	2	66.667	0	0
	R2	1	33.334	1	33.334	1	33.334	0	0
	R3	1	33.334	2	66.667	0	0	0	0
3. Are you satisfied with how well your upper denture stays in place?	R1	0	0	1	33.334	1	33.334	1	33.334
	R2	1	33.334	1	33.334	1	33.334	0	0
	R3	1	33.334	2	66.667	0	0	0	0
4. Are you satisfied with how well your lower denture stays in place?	R1	0	0	1	33.334	1	33.334	1	33.334
	R2	1	33.334	1	33.334	1	33.334	0	0
	R3	1	33.334	2	66.667	0	0	0	0
5. Are you satisfied with how well your chew food is with your denture?	R1	0	0	2	66.667	1	33.334	0	0
	R2	2	66.667	1	33.334	0	0	0	0
	R3	2	66.667	1	33.334	0	0	0	0
6. Are you satisfied with how you speak with your dentures?	R1	0	0	2	66.667	1	33.334	0	0
	R2	2	66.667	1	33.334	0	0	0	0
	R3	2	66.667	1	33.334	0	0	0	0
7. Are you satisfied with the comfort of your upper denture?	R1	0	0	2	66.667	1	33.334	0	0
	R2	2	66.667	1	33.334	0	0	0	0
	R3	2	66.667	1	33.334	0	0	0	0
8. Are you satisfied with the comfort of your lower denture?	R1	0	0	2	66.667	1	33.334	0	0
	R2	1	33.334	2	66.667	0	0	0	0
	R3	2	66.667	1	33.334	0	0	0	0
9. Are you satisfied with how well other people (such as wife, husband, children, etc.) like your denture?	R1	2	66.667	1	33.334	0	0	0	0
	R2	2	66.667	1	33.334	0	0	0	0
	R3	2	66.667	1	33.334	0	0	0	0

Table (2): Distribution of the response to "patient denture satisfaction questionnaire" for balanced denture of three different periods (R1,R2,R3)

Number / Question		Totally satisfied		Fairly satisfied		Fairly dissatisfied		Totally dissatisfied	
		No	%	No	%	No.	%	No.	%
1. Are you satisfied with your dentures?	R1	0	0	1	33.334	2	66.667	0	0
	R2	1	33.334	2	66.667	0	0	0	0
	R3	1	33.334	2	66.667	0	0	0	0
2. Are you satisfied with the appearance of your denture?	R1	0	0	2	66.667	1	33.334	0	0
	R2	1	33.334	1	33.334	1	33.334	0	0
	R3	2	66.667	1	33.334	0	0	0	0
3. Are you satisfied with how well your upper denture stays in place?	R1	0	0	1	33.334	2	66.667	0	0
	R2	1	33.334	1	33.334	1	33.334	0	0
	R3	1	33.334	2	66.667	0	0	0	0
4. Are you satisfied with how well your lower denture stays in place?	R1	0	0	1	33.334	2	66.667	0	0
	R2	1	33.334	2	66.667	0	0	0	0
	R3	1	33.334	2	66.667	0	0	0	0
5. Are you satisfied with how well your chew food is with your denture?	R1	0	0	2	66.667	1	33.334	0	0
	R2	1	33.334	2	66.667	0	0	0	0
	R3	1	33.334	2	66.667	0	0	0	0
6. Are you satisfied with how you speak with your dentures?	R1	1	33.334	2	66.667	0	0	0	0
	R2	2	66.667	1	33.334	0	0	0	0
	R3	2	66.667	1	33.334	0	0	0	0
7. Are you satisfied with the comfort of your upper denture?	R1	0	0	2	66.667	1	33.334	0	0
	R2	1	33.334	2	66.667	0	0	0	0
	R3	1	33.334	2	66.667	0	0	0	0
8. Are you satisfied with the comfort of your lower denture?	R1	0	0	1	33.334	2	66.667	0	0
	R2	1	33.334	2	66.667	0	0	0	0
	R3	1	33.334	2	66.667	0	0	0	0
9. Are you satisfied with how well other people (such as wife, husband, children, etc.) like your denture?	R1	2	66.667	1	33.334	0	0	0	0
	R2	2	66.667	1	33.334	0	0	0	0
	R3	2	66.667	1	33.334	0	0	0	0

Identify the relation between the satisfaction of patient to complete denture with linguallized articulation to complete denture with

balanced articulation after two months R3 were shown in Figures (6 to 14).

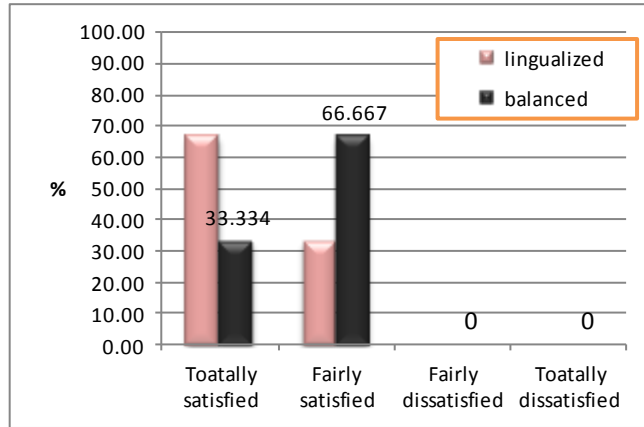


Figure (6): Distribution of patient answers according to their overall satisfaction with lingualized dentures and balanced dentures.

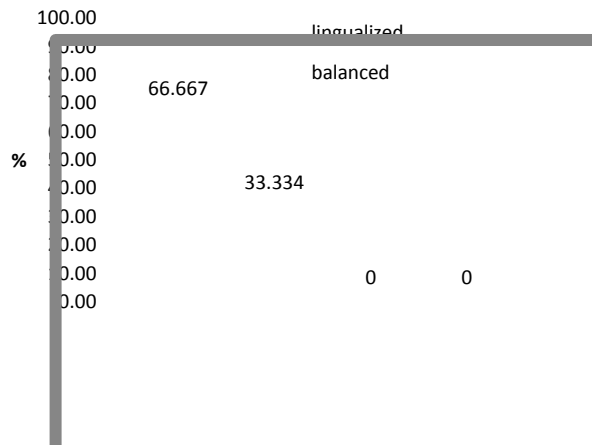


Figure (7): Distribution of patient answers according to their overall esthetics with lingualized dentures and balanced dentures.

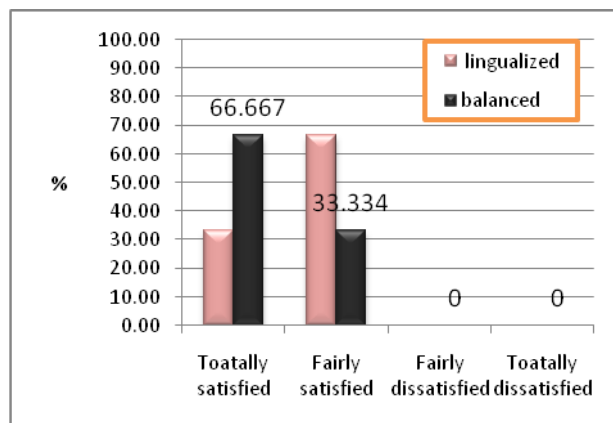


Figure (8): Distribution of patient answers according their well your upper denture stays in place with lingualized dentures and balanced dentures.

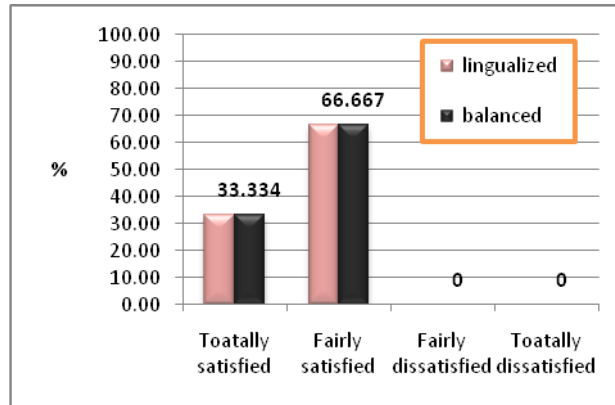


Figure (9): Distribution of patient answers according to their well lower denture stays in place with lingualized dentures and balanced dentures.

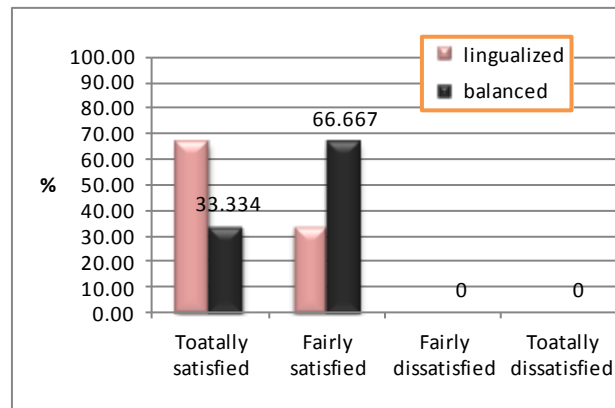


Figure (10): Distribution of patient answers according to their chewing ability with lingualized dentures and balanced dentures.

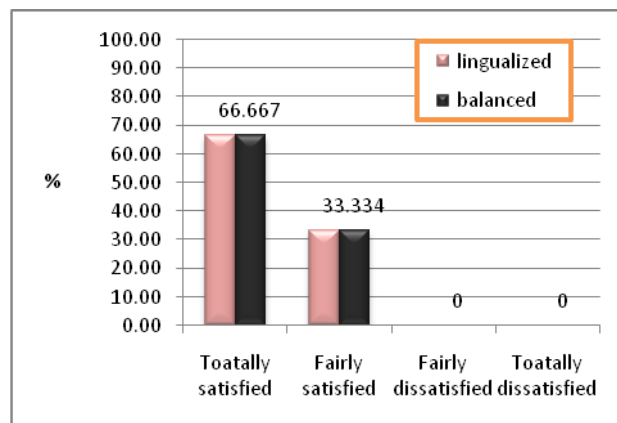


Figure (11): Distribution of patient answers according to their speaking ability with lingualized dentures and balanced dentures.

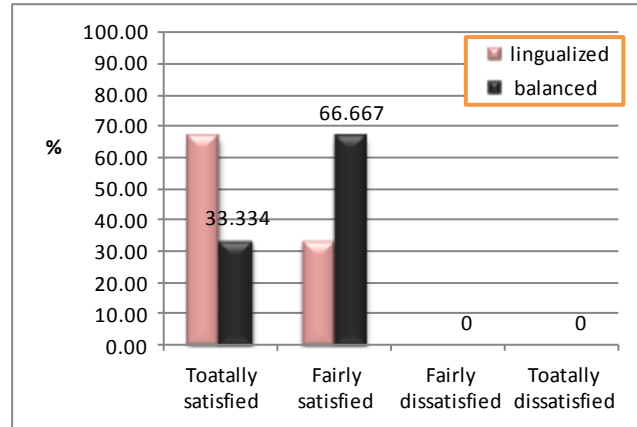


Figure (12): Distribution of patient answers according to their comfort of your upper denture with lingualized dentures and balanced dentures.

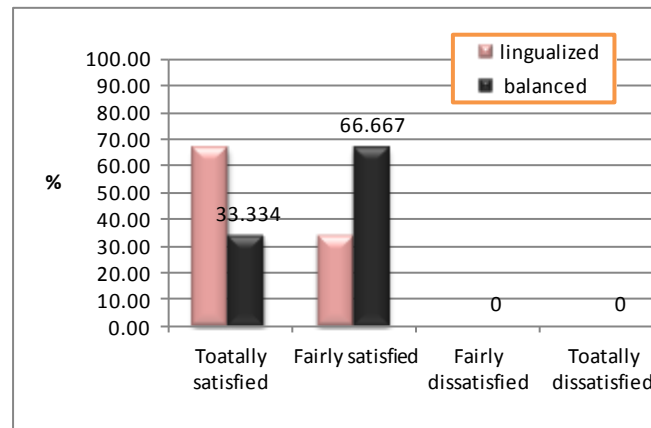


Figure (13): Distribution of patient answers according to their comfort of your lower denture with lingualized dentures and balanced dentures.

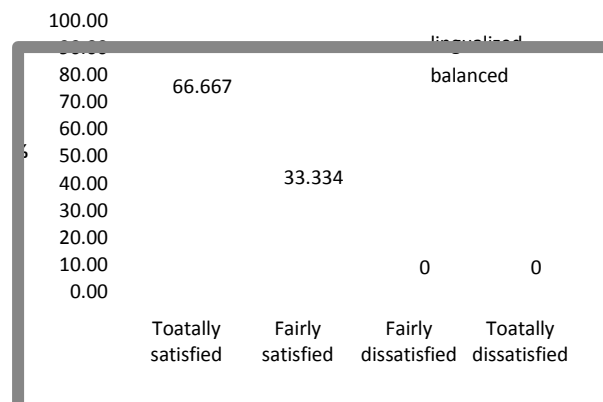


Figure (14): Distribution of patient answers according to the opinion of other people with lingualized dentures and balanced dentures

Patient satisfactions, speaking ability and jawing ability showed 66.667% of complete dentures with lingualized occlusion. After 2 months, the patient take a decision to wear complete denture with lingualized occlusion.

DISCUSSION

According to the results in Table (1 and 2), and it is found that the satisfaction from lingualized occlusion denture is more than the satisfaction from balanced occlusion denture , as well as the chewing ability and comfort of the upper and lower dentures Figure (6,10, and 13). This is because the freedom in centric that allow the patient to make the masticatory movement freely^(5,10,13).

According to the results [The stability of denture in its place (upper and lower)] and the esthetic standards of balanced occlusion denture is higher than lingualized occlusion denture, Figure (7-9) because the use of the anatomic teeth which gives the denture more esthetic and more stability (interlocking closure during the articulation)^(2,4,13).

There is no difference in speaking ability and the acceptance of the denture from other people(such as wife, housebound, children, etc.) because there are minor changes in the posterior segment which are not remarkable by the others, and these changes have not affect the phonetics representation of the patients^(2,4).

All these results depended on the patient's opinion and their previous experiences of wearing denture and these variables are related to the patient's judgments.

CONCLUSIONS

1. The lingualized occlusion dentures have more satisfaction, chewing ability and comfort.
2. The balanced occlusion dentures are more stable in their places and more esthetically acceptable.

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