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Satisfaction with complete immediate dentures and complete immediate overdentures. A 1 year survey

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SUMMARY The aim of this study was to evaluate denture satisfaction over a 1 year period after extraction of the last teeth. Seventy-four patients who required immediate denture therapy in the mandible were randomly treated, (1) with complete immediate dentures (22); (2) with immediate overdentures on two lower canines without attachments (26); or (3) with immediate overdentures on two lower canines provided with Dyna® direct magnetic attachments, inserted on the abutments 9 months after treatment (26). Denture satisfaction was estimated by means of questionnaires, filled out by each patient at certain periods, starting

before treatment and ending 1 year after denture insertion. After 1 year approximately 85% of the patients in the three groups were satisfied with their dentures, had got used to them and could eat well. This phenomenon was constant over the whole first year period. No differences in denture satisfaction were found between the three groups. It can be concluded that although patients who receive immediate complete dentures might experience a lot of discomfort during the first year of edentulousness, they are satisfied, in general, with their dentures independent of the treatment procedure.

Introduction

Several studies have shown that 20-30% of denture wearers have problems with their dentures and are dissatisfied (Van Waas, 1990a,b,c; Van Waas, Kalk & Engels, 1992). The majority of these problems are caused by mandibular dentures with poor stability and retention which chewing problems, pain and discomfort. It is during the last decades, therefore, that overdenture treatment has become one of the main strategies in preventive prosthodontics (Kalk, Van Rossum & Van Waas, 1990). Retaining teeth is assumed not only to reduce bone resorption, but also to improve denture function (Brewer & Morrow, 1975). The first is supported by a study undertaken by Steen (1984) and also by another part of this study, reported by Van Waas *et al.* (1993). Both studies found that overdentures diminish the rate of mandibular bone resorption to 50%, the first year after extraction of teeth, when canines were left underneath mandibular dentures. Improvement of denture function also may be present since the proprioceptive abilities of the abutment

teeth underneath overdentures are capable of maintaining an adequate neuromuscular reflex system (Pacer & Bouman, 1975; Mushimoto, 1981). Whether these improvements in the oral condition also lead to a higher rate of denture satisfaction has not been reported until now.

The influence on denture satisfaction of using attachments in overdenture therapy has been analysed insufficiently. Sposetti *et al.* (1986), as well as Jackson & Healey (1987), found that the stability and the retention of the mandibular denture function is improved by the insertion of attachments, but it is unclear whether this leads to high rates of denture satisfaction.

The aim of this study was to evaluate denture satisfaction in patients randomly either with immediate complete dentures or with immediate overdentures with and without attachments.

Materials and methods

Seventy-four patients were selected out of the patient population who required dental treatment at the

University Dental Clinic in Nijmegen, the Netherlands, between September 1986 and July 1988. All of them had severely decayed and/or periodontally involved teeth. In the maxilla an immediate denture was indicated or there was a complete denture already present. For the mandible, the patients were treated with either an immediate complete denture or an immediate overdenture on the roots of the lower canines after verbal and written explanation of the research design and the patient's acceptance of the treatment plan. Three groups were set up balanced on age, gender, periodontal condition (periodontal breakdown more or less than 2/3 of the root length) and the presence or absence of teeth in the (pre)-molar regions of the mandible. The first group received an immediate complete denture (group 1), the second received an immediate overdenture on two lower canines without attachments (group 2), and the third group received overdentures on the lower canines provided with magnetic Dyna® direct attachments 9 months after extraction and denture insertion (group 3). With a balancing procedure (Zielhuis *et al.*, 1990) 22 patients were allocated to group 1, and 26 to both overdenture groups (groups 2 and 3). Distribution of the patients according to the criteria, used in the balancing procedure, is given in Table 1. No significant differences between the three groups were present by Chi-square test ($\alpha = 0.05$).

The patients filled out questionnaires at certain periods, i.e. before treatment and 1, 3, 6 and 12 months after treatment. All questionnaires consisted of items with a forced choice answer possibility and dealt with patients' general satisfaction with their dentures, comfort, chewing ability and appearance. For the analysis of differences between the groups six scales were created. With respect to the comfort of the maxillary and mandibular denture

two scales were created: 'Comfort maxillary denture' (range -1-3, Cronbach's $\alpha = 0.74$) and 'Comfort mandibular denture' (range 1-5, Cronbach's $\alpha = 0.78$). Each consisted of the items 'pain caused by the denture', 'well fitting of the denture' and 'retention of the denture'. Concerning chewing ability, two scales were created called 'chewing hard foods', consisting of the items on chewing cheese, chops, carrots and biting of an apple (range 1-3, Cronbach's $\alpha = 0.76$), and 'chewing soft foods' consisting of the items on chewing bread without crusts, potatoes, vegetables and meat balls (range 1-3, Cronbach's $\alpha = 0.82$). With respect to appearance with the dentures one scale was created called 'appearance' (range 1-5, Cronbach's $\alpha = 0.82$). A 'general satisfaction' scale was made with the item 'Are you satisfied with your denture?' and the above mentioned scales 'comfort mandibular denture', 'comfort maxillary denture' and 'chewing hard food' (range 3-16, Cronbach's $\alpha = 0.74$). For all scales' means the higher the score, the more dissatisfied the patient is.

Results

Denture satisfaction after 1 year

The opinions of the patients regarding the functioning of the dentures 1 year after treatment is given in Table 2. It shows that 83% of all patients were satisfied with their dentures in general. Nine per cent suffered from pain caused by the maxillary denture and for another 9% retention of the maxillary denture was insufficient. The mandibular denture caused more problems: 15% suffered from pain and 23% mentioned poor retention. A majority (76%) could eat properly and 79% considered themselves able to get used to wearing a denture.

Treatment group	1 <i>n</i> = 22	2 <i>n</i> = 26	3 <i>n</i> = 26
Male	17	16	17
Female	5	10	9
Mean age in years (\pm s.d.)	56 (\pm 12)	53 (\pm 11)	53 (\pm 11)
Periodontal condition			
good	5	12	9
poor	17	14	17
Posterior dentition			
yes	13	13	13
no	9	13	13

Table 1. Distribution of the patients according to the balancing criteria

*1: immediate complete denture group; 2: immediate overdenture group without attachments; 3: immediate overdenture group with Dyna® direct attachments.

Table 2. Answers concerning denture satisfaction 1 year after treatment for all patients ($n = 74$) (%)

	1	2	3	4	5
Are you satisfied with your denture?	55	28	9	7	1
Do you suffer from pain caused by your upper denture?	2	7	10	31	50
How is the retention of your upper denture?	45	40	6	7	2
Do you suffer from pain caused by your lower denture?	5	10	15	35	35
How is the retention of your lower denture?	40	30	7	16	7
Can you eat properly with your denture?	45	31	15	9	0
Are you getting used to wearing dentures?	47	32	15	6	0

1: very much/very good; 2: much/good; 3: indifferent; 4: hardly/poor; 5: totally not/very poor.

Satisfaction over the first year

For the presentation of the results over the first period after treatment both overdenture groups (groups 2 and 3) were combined. This was done as no differences in treatment between these two groups were present up to 6 months after denture insertion. Figures 1–6 present the mean scores on the scales for the immediate complete denture group (group 1) and the combined overdenture groups (groups 2 & 3) at the several evaluation moments up to 1 year after denture placement.

The figures show that hardly any changes in the average scores of scales are present during the first year period with respect to the scales 'comfort maxillary denture', 'chewing hard foods', 'chewing soft foods' and 'appearance'. The scores stayed at a constant low level which means high satisfaction during the whole period

concerning comfort, chewing soft food and appearance, and at a constant moderate level on chewing hard food. The scores on the scale 'comfort lower denture' gave some discrepancies during the first year period. At the 6 month evaluation the overdenture groups had a significantly favourable score on the scale. However, this phenomenon was not present at any of the other evaluations.

In Fig. 6 the mean scores on the scale 'general satisfaction' are shown. The scores of the complete denture group are constant, while the scores of the overdentures group slightly improved. The scores of both groups can be interpreted as 'satisfactory'.

Differences between the groups

The mean scores on the scales 1 year after treatment for the three groups separately are presented in Table 3. Only

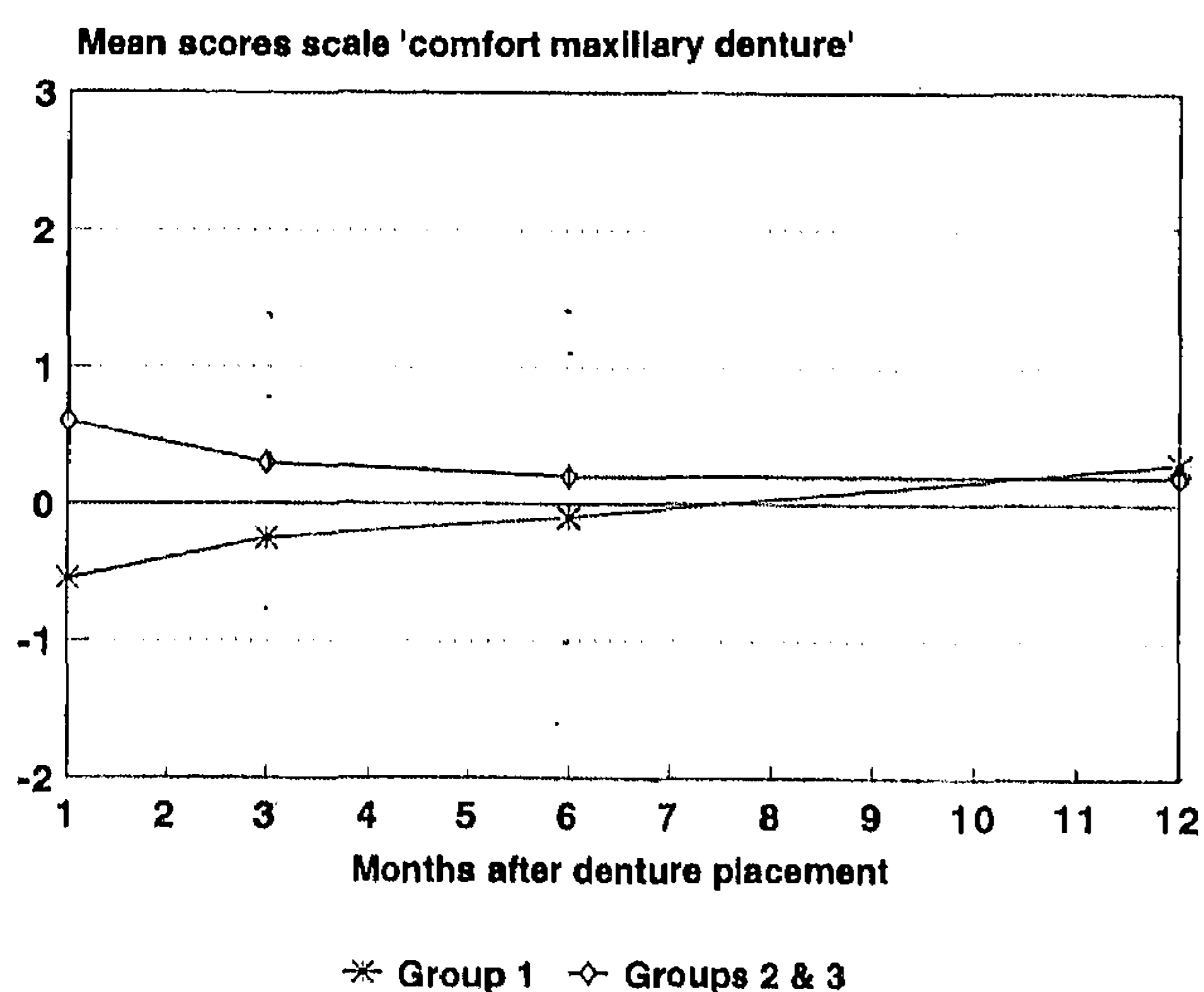


Fig. 1. Mean scores and their standard deviations on the scale 'comfort maxillary denture' at different moments during the first year after the insertion of the dentures.

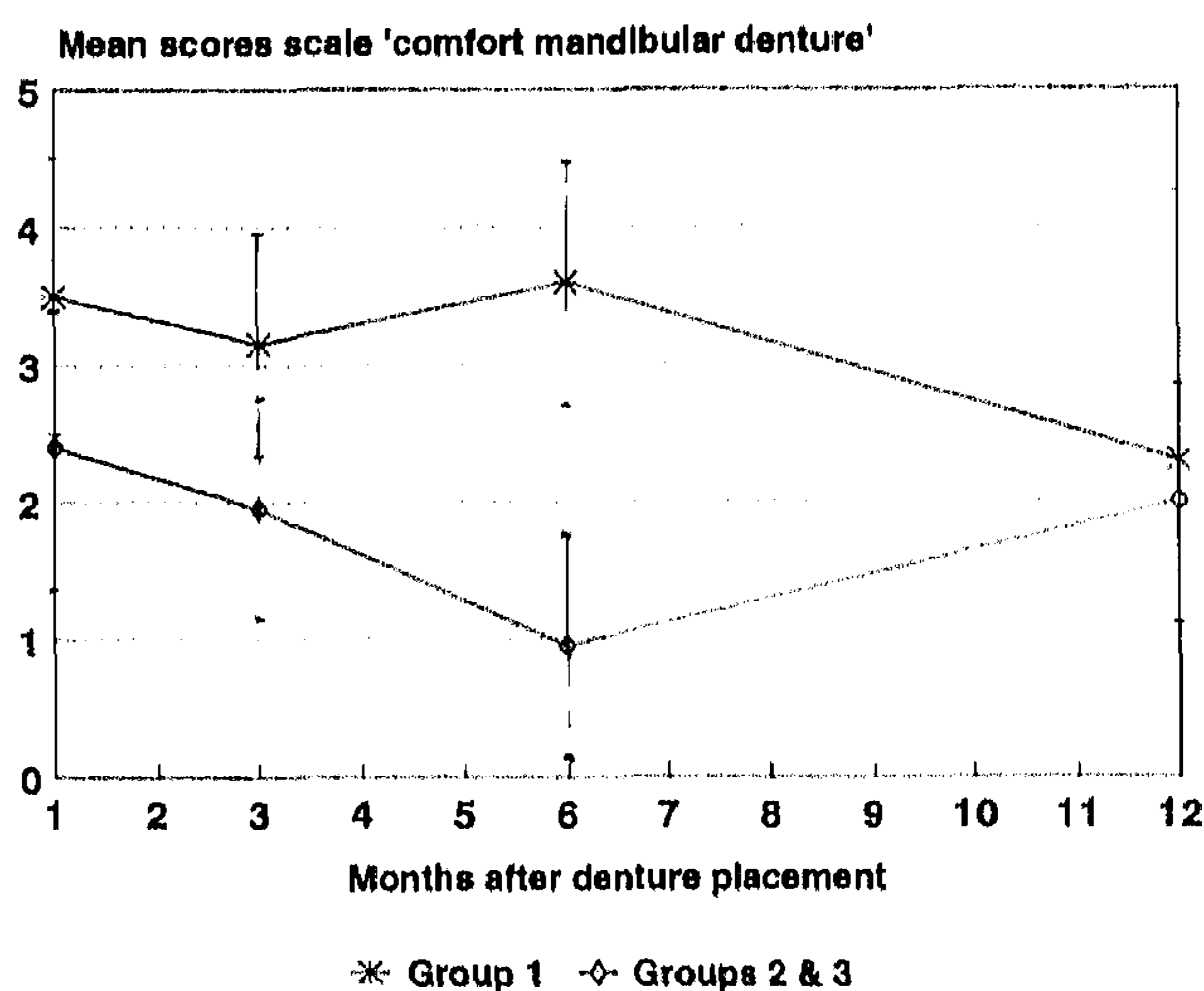


Fig. 2. Mean scores and their standard deviations on the scale 'comfort mandibular denture' at different moments during the first year after the insertion of the dentures.

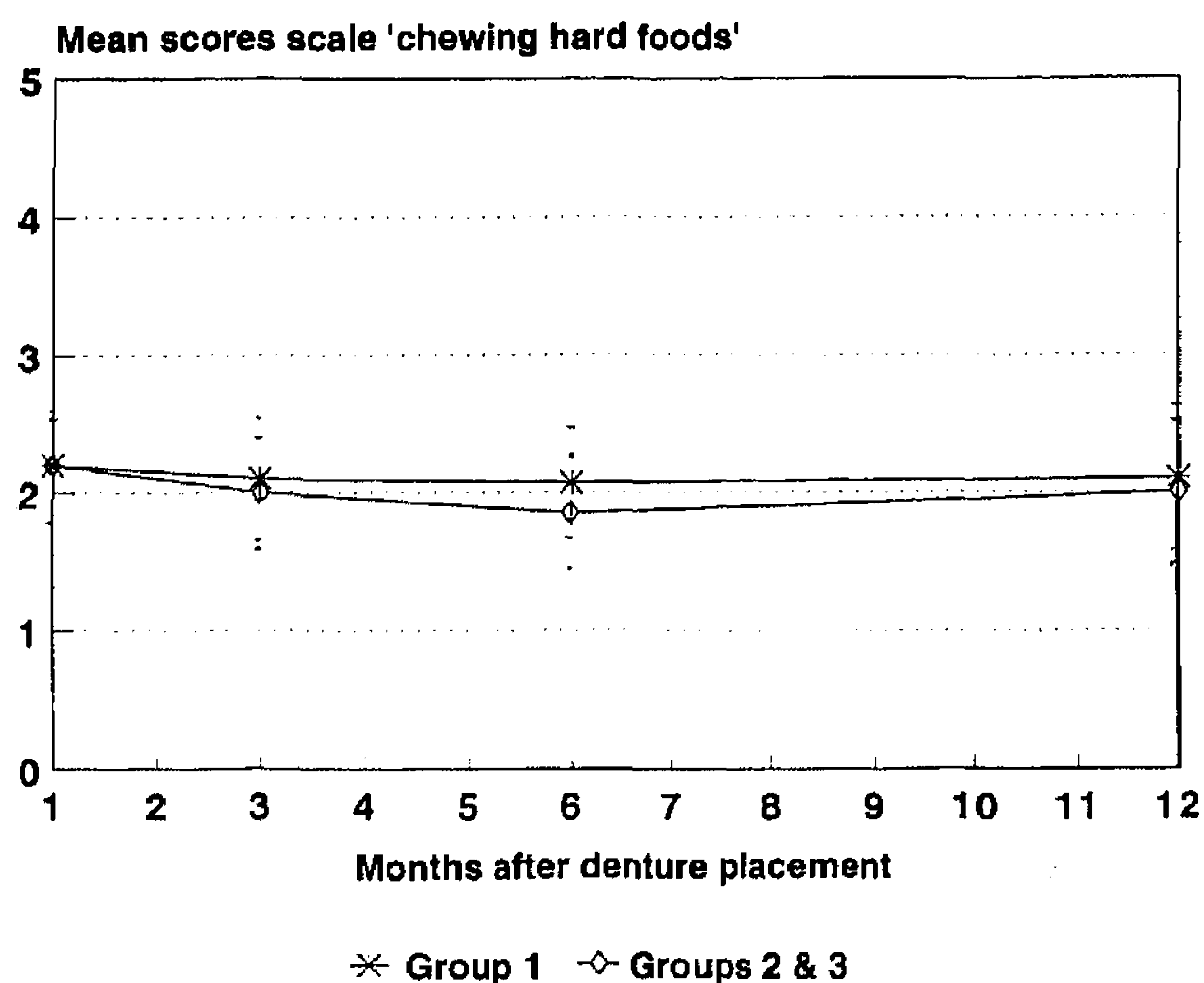


Fig. 3. Mean scores and their standard deviations on the scale 'chewing hard foods' at different moments during the first year after the insertion of the dentures.

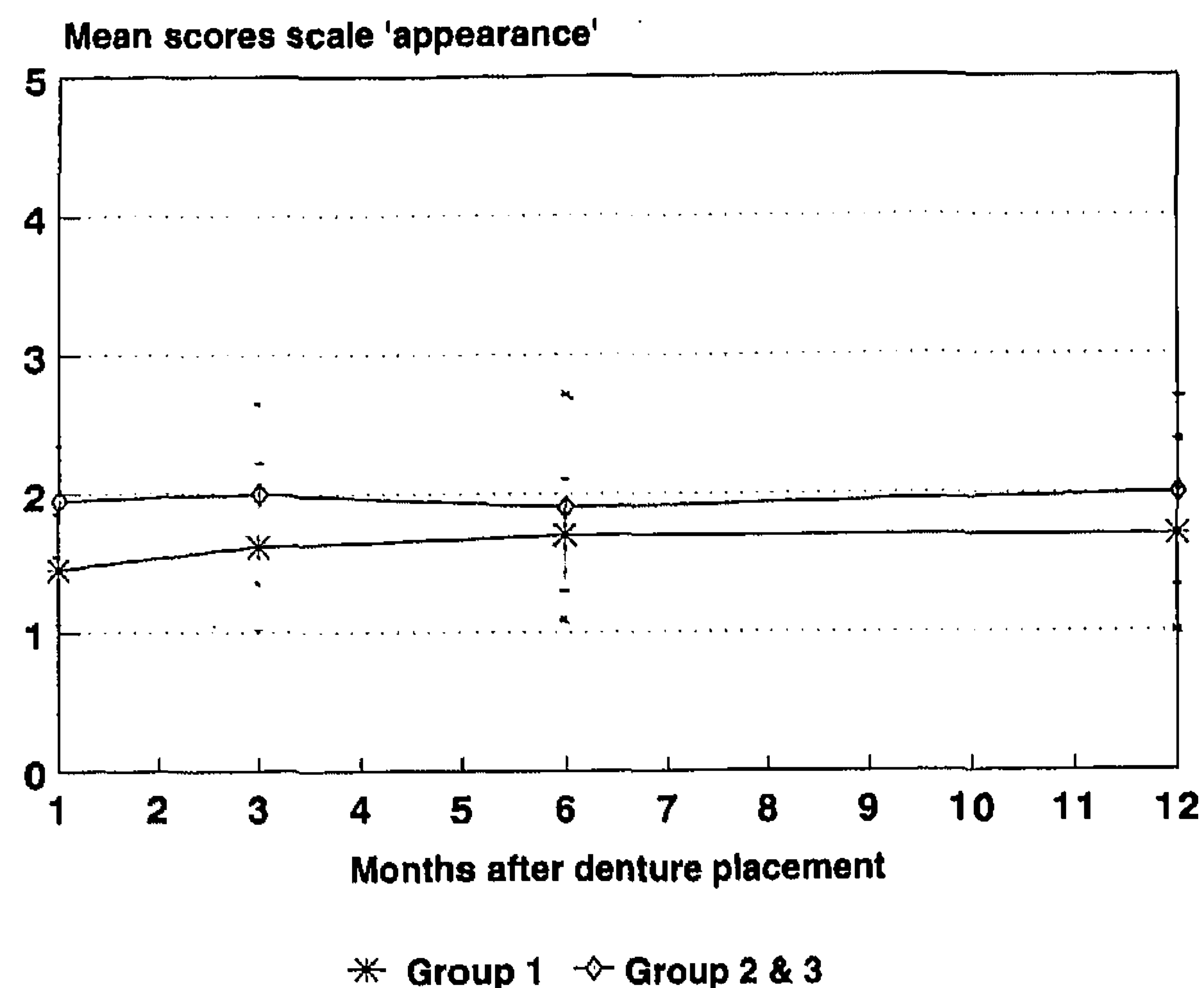


Fig. 5. Mean scores and their standard deviations on the scale 'appearance' at different moments during the first year after the insertion of the dentures.

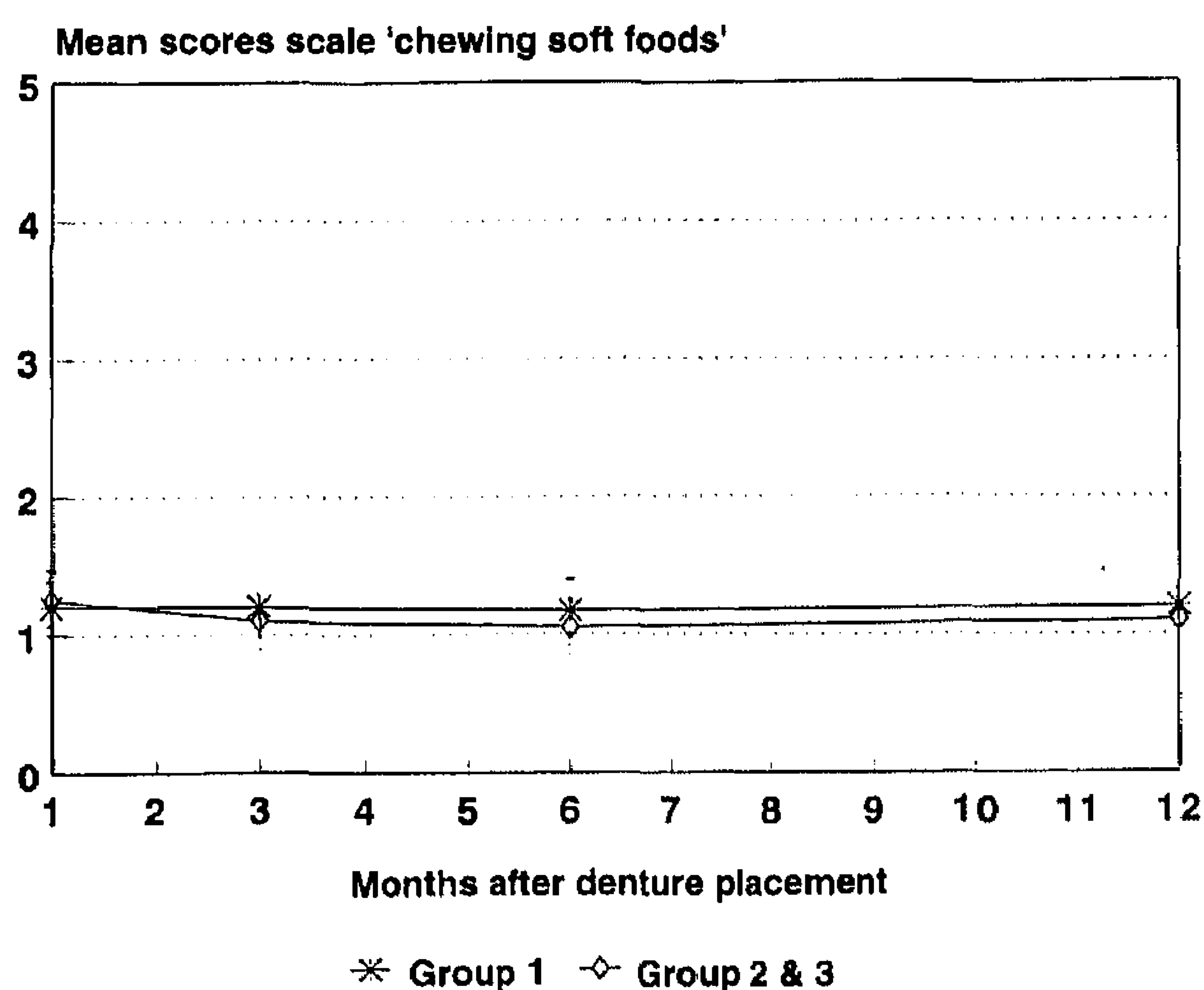


Fig. 4. Mean scores and their standard deviations on the scale 'chewing soft foods' at different moments during the first year after the insertion of the dentures.

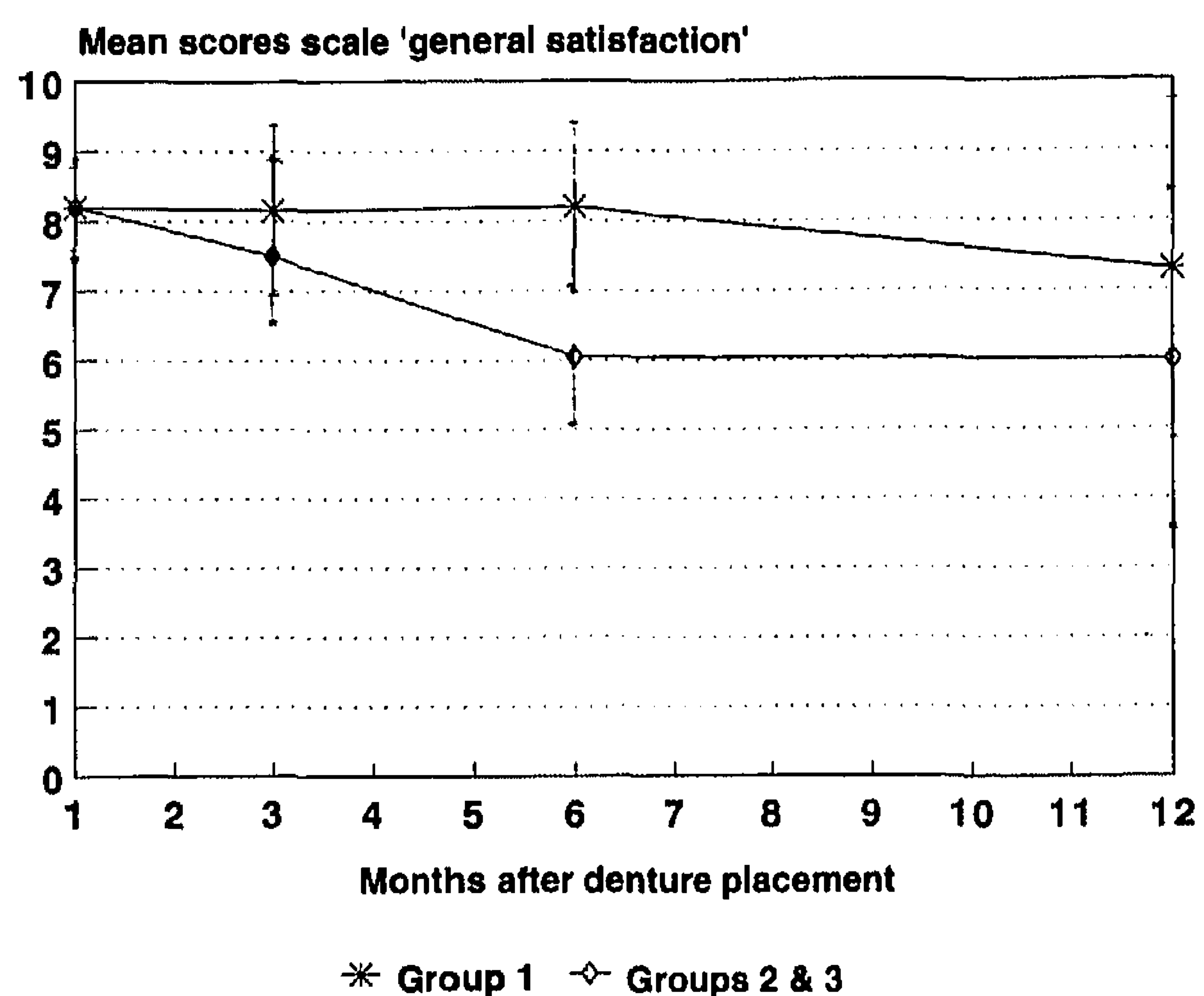


Fig. 6. Mean scores and their standard deviations on the scale 'general satisfaction' at different moments during the first year after the insertion of the dentures.

small, not significant, differences in the scores between the groups are present using the Bonferroni test ($\alpha = 0.05$).

Discussion

At the Dental School of Nijmegen the criteria for overdenture treatment are as described by Brewer & Morrow (1975). Patients who clearly met these criteria were excluded from this study. Thus, the selected patients were borderline cases for whom a particular form of treatment, with immediate overdentures or immediate complete dentures, was not clearly indicated.

The treatment was allocated by balancing. This means that the groups were identical in age, gender, periodontal condition and the presence or absence of teeth in the (pre)molar regions of the mandible. Next to this all patients were treated in the same way by students under the supervision of experienced prosthodontists. Patients were aware of their participation but no preference was given on one of the treatment strategies. This was possible on the basis of the above mentioned selection and made the groups highly comparable.

Most subjects were satisfied with the functioning of their dentures during the first year after the extraction

Table 3. Mean scores (x) and their standard deviations (s.d.) of the scales 1 year after treatment

Group	1 x (s.d.)	2 x (s.d.)	3 x (s.d.)
Comfort maxillary denture	0.3 (1.9)	0.3 (1.8)	0.3 (1.8)
Comfort mandibular denture	2.3 (0.9)	1.7 (2.3)	2.0 (2.0)
Chewing hard foods	2.1 (0.5)	2.0 (0.4)	2.1 (0.6)
Chewing soft foods	1.2 (0.3)	1.1 (0.2)	1.1 (0.3)
Appearance	1.7 (0.7)	2.0 (0.6)	1.8 (0.6)
General satisfaction	7.3 (4.2)	6.1 (4.6)	6.4 (4.5)

of the last teeth and denture insertion. Only a few had some problems with respect to retention and pain caused by the mandibular denture. This is in contrast with the remarks of Ellinger *et al.* (1975) and Sharry (1978) who mentioned, in their books on complete dentures, common problems such as pain and instability due to rapid bone resorption during the first year. A reason for the results of this study might be that treatment of the patients was extensive during the first year (Jonkman & Plooij, 1992). The patients often attended the Dental School and many relinings and denture corrections were made. Another reason might be that the patients were in 'high spirits' due to the fact that they had been freed from problems with their natural dentition.

No differences in satisfaction was found between the three groups. On the basis of the often mentioned advantages of overdenture therapy (Brewer & Morrow, 1975; Kalk *et al.*, 1990) and the diminished mandibular bone resorption (Steen, 1984; Van Waas *et al.*, 1993) one should expect that the overdenture group would be more satisfied. The magnetic attachments should also increase denture satisfaction, since stability and retention objectively increased (Jackson & Healey, 1987). A reason for not finding any differences might be the relatively short evaluation period. The alveolar maxillary and mandibular processes were still in relatively good shape. This might change in future when differences in bone resorption, especially of the mandible, are more extensive and the differences in retention of the denture become more manifest.

Another reason for not finding differences between the groups might be that there is no possibility for comparison: the overdenture wearer has not experienced what it is like wearing a conventional complete denture and vice versa. This could lead to a similar level of acceptance or satisfaction by accepting the limitation of the situation wearing a conventional denture as well as an overdenture. In disagreement with this is that group 3

has had the possibility to compare. This group received Dyna[®] magnetic attachments 9 months after denture placement. For that reason it is remarkable that they have not influenced any of the scores on the scales, especially the scale 'comfort lower denture'. The two magnets might only give marginal extra retention. Another reason for not finding differences might be that most of the subjects do not have any need for more retention. It gives support to the rule of the Dental School Nijmegen that attachments are not to be inserted automatically when making an overdenture. They should only be applied in those cases where patients complain about retention.

Conclusions

During the first year period after denture insertion a high level of satisfaction with immediate (over)dentures was present.

There were no differences in comfort, chewing ability, aesthetics and general satisfaction between patients wearing immediate complete dentures and patients wearing immediate overdentures 1 year after denture insertion, and was not influenced by the insertion of Dyna[®] direct magnetic attachments.

Acknowledgments

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