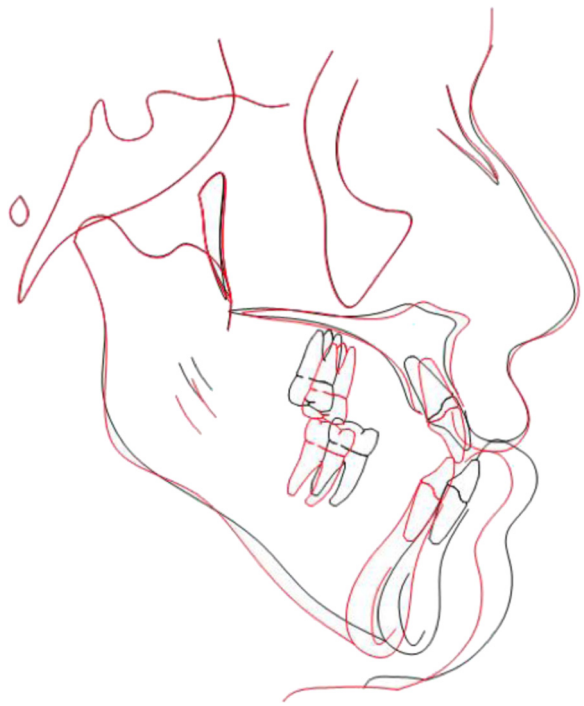

Fig. 3 Superimposition of pre- and post-treatment and traced cephalometric tracing showing advancement of the maxilla and setback of the mandible

consistently accurate with prediction results [11]. Lu suggested that this might occur because the computer generated surgery mainly involves sagittal algorithms. Our findings conflict with this statement.

We analyzed 14 patients in this study, which was higher than the 12 patients suggested by the power analysis. The results of the calculated prediction error in this study were very consistent with previous studies. Accuracy was 79 % (*X*-axis) and 61 % (*Y*-axis) with and error of acceptable error set at 2.0 mm. If Me' and Gn' are excluded, the accuracy increased to 84 % (*X*-axis) and 63 % (*Y*-axis). A study by Pektas et al. calculated an overall error of 91 % for the sagittal direction and 68 % in the vertical direction for errors <2.0 mm [12]. Pektas' study however did not include Me' and Gn'. Me' and Gn were less accurate as compared to other landmarks in the horizontal direction.

Kazandjian et al. found that prediction errors of 1.0–2.0 mm were found to be clinically acceptable by orthodontists, surgeon, and lay people [13]. Most literature categorizes errors into <1.0-, 1.0–2.0-, and 2.0-mm groups. Although this acceptability of error 1.0–2.0 mm was found to be reliable, Kaipatur and Flores-Mir discussed that compounding areas of acceptable errors individually might lead to an overall unacceptable prediction [14]. Hence, different categories of acceptable

Table 2 Error of frequency of subjects and range of acceptable error in the *X*-axis

Patient name	Tip of the nose	Subnasale	ST A	Upper lip	Lower lip	ST B	ST Pg	ST Mn	ST Gn	Overall average
Subject 1	1.3	0.6	−1.1	−2.2	0.1	−0.6	0	9.3	3.3	
Subject 2	1.4	2.1	0.2	1.2	4.2	0.8	0.7	0.8	−0.1	
Subject 3	0.2	0.3	1.3	−1.2	4.7	−0.1	8.3	0.6	3.9	
Subject 4	−1.1	0.8	−1.3	−1.6	2.5	−0.3	−0.6	−0.9	−0.9	
Subject 5	−1.1	−1.4	−1	−4.7	4	−1.9	0.6	16	6.2	
Subject 6	0.1	3.4	3.7	0.3	3.7	0.5	3.1	−4.5	−1.7	
Subject 7	−1.8	−0.3	−1.9	0.4	3.2	−0.2	1.9	4.5	1.9	
Subject 8	−0.3	−6	−1.9	−1.5	0.8	−1	2.6	−0.4	1.4	
Subject 9	0.5	1.6	−0.7	−0.8	−0.1	−1.1	0	0.4	0.6	
Subject 10	0.1	−0.9	0.4	−2.5	1.9	−0.2	2.1	4.2	2.1	
Subject 11	−0.5	−0.2	−1.1	−1.5	1.1	0.6	1.7	0.2	1.3	
Subject 12	−0.1	0.6	0.4	0.6	3.6	0.1	0.7	3.5	0.6	
Subject 13	0.1	−0.8	−1.2	−3.5	0.5	−0.6	0.2	−1.9	0.8	
Subject 14	0.5	−1.8	−0.8	−0.5	2	−1.2	−0.2	−2.8	−1.6	
Mean	−0.05	−0.14	−0.36	−1.25	2.30	−0.37	1.51	2.07	1.27	
Mean (absolute value)	0.65	1.49	1.21	1.61	2.31	0.66	1.62	3.57	1.89	
SD	0.89	2.19	1.49	1.64	1.63	0.76	2.26	5.31	2.17	
Percent of acceptable error <0.5 mm	64 %	21 %	21 %	21 %	21 %	43 %	29 %	21 %	7 %	28 %
Percent of acceptable error <1 mm	64 %	57 %	36 %	36 %	29 %	71 %	57 %	43 %	36 %	48 %
Percent of acceptable error <2 mm	100 %	78 %	92 %	71 %	57 %	100 %	92 %	50 %	71 %	79 %