Supplemental Results

Patient flow & drop-outs

One patient did not complete the baseline polysomnography (PSG) due to time constraints. Seventeen patients were lost to follow-up after the baseline PSG and did not complete the 3-month follow-up PSG. Seven subjects quitted because of time constraints, two patients due to financial reasons, four patients did not show up at appointments several times despite regular reminders, two patients quitted due to insufficient OSA reduction, one patient stopped its treatment due to OSA resolution by weight reduction and one patient moved abroad. No significant difference in baseline parameters were found between these patients and the patients who completed the 3-month follow-up (Table S1). BMI, arousal index and age values were normally distributed and thus tested using unpaired t-tests. All other parameters were tested using the Mann-Whitney U test.

Effect of MAD treatment on clinical parameters

As described in the manuscript, 72 patients underwent the 3-month follow-up PSG. As shown in Table S2, these patients showed a significant change in AHI, min SaO_2 , ODI, BMI, visual analogueue scale representing snoring, Epworth Sleepiness Scale score, apnoea index, hypopnea index and supine and non-supine AHI. No significant difference was shown for any other parameter.

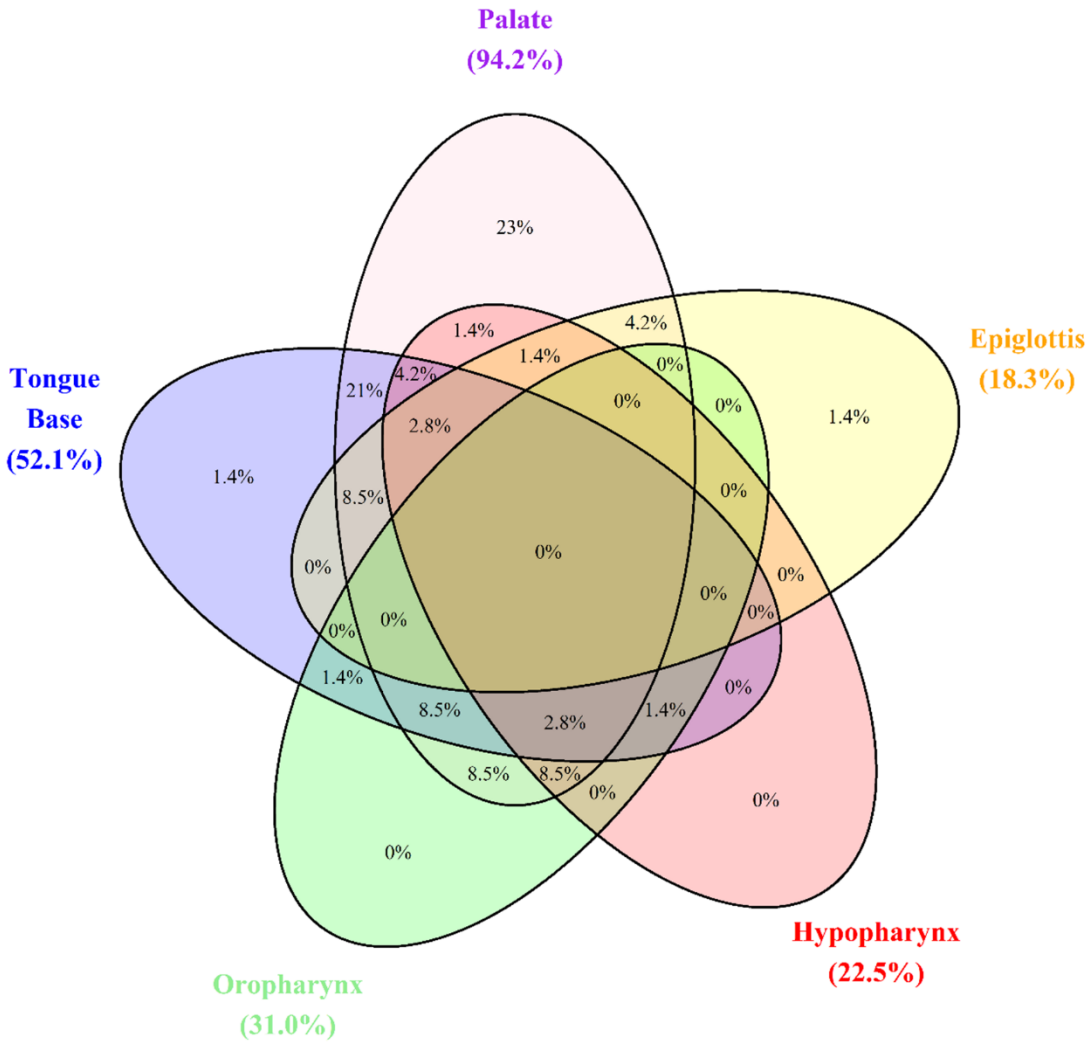
Table S3 shows the difference in baseline parameters between responders and non-responders after 3 months of treatment. No significant difference in baseline parameters was present between both groups.

Drug-induced sleep endoscopy

A Venn diagram visualising the percentage distribution of the visualized collapse sites is shown in Figure S1. Palatal collapse (94.2%) was the most prevalent in our dataset, followed by tongue base (52.1%), oropharyngeal (31.0%), hypopharyngeal (22.5%) and epiglottic (18.3%) collapse. 74.6% of all patients suffered from multilevel collapse.

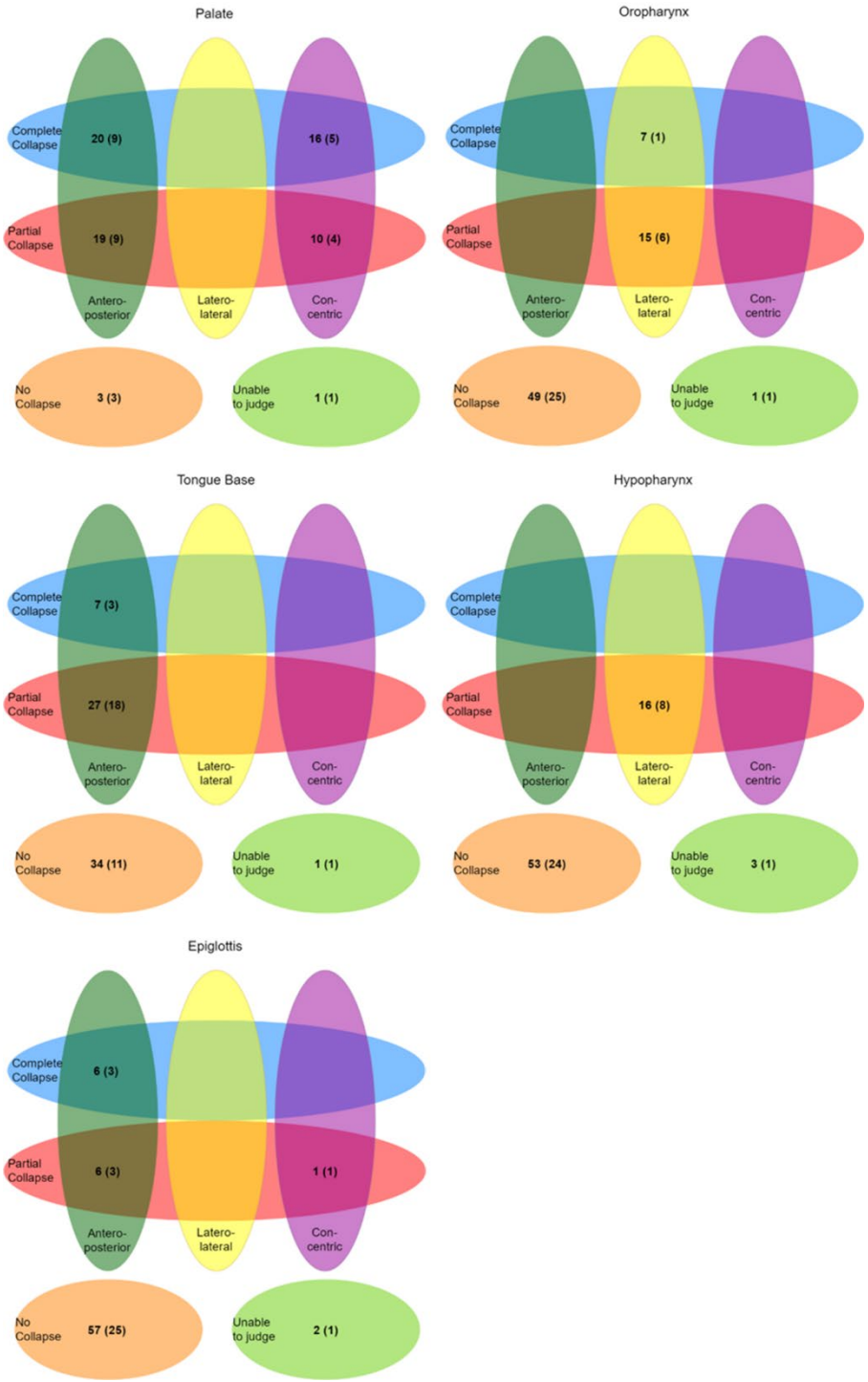
Figure S2 represents the distribution for each collapse site. The amount of responders per category is shown in brackets. Only palatal collapse was present in all three directions (anteroposterior, laterolateral and concentric). Oropharyngeal and hypopharyngeal collapse were only present in laterolateral direction, while tongue base was only present in anteroposterior direction. Epiglottic collapse was only present in anteroposterior direction in all but one patient who showed concentric epiglottic collapse.

Figure S1: Venn diagram representing sites of collapse.



In 1 person, it was impossible to assess the upper airway collapse sites. 74.6% of the patients suffered from multilevel collapse. Most patients (94.2%) suffered from palatal collapse, followed by tongue base (52.1%), oropharyngeal (31.0%), hypopharyngeal (22.5%) and epiglottic (18.3%) collapse. 74.6% suffered from multilevel collapse. The amount of responders for each category is shown in brackets.

Figure S2: Distribution of complete and partial collapse and collapse direction for each collapse site.



Amount of responders per category in brackets. Regarding palatal collapse, it was not possible to classify 3 patients (2 complete; 1 responder, 1 partial; 0 responders) into one of the three collapse directions as these patients showed ‘doubtful CCCp’.

Table S1: Baseline characteristics drop-outs and patients continuing the protocol.

Parameter	Continued (n = 72)	Drop-out after baseline PSG (n = 17)	p-value
	Mean ± SD or Median (Q1 – Q3)	Mean ± SD or Median (Q1 – Q3)	
AHI (/h)[1]	15.6 (10.5 – 23.4)	23.4 (11.2 – 24.8)	0.2240
VAS (0-10)[1]	6.0 (5.0 – 9.0)	8.5 (7.5 – 9.3)	0.1160
ESS (0-24)[1]	7.0 (3.8 – 13.0)	7.0 (3.8 – 13.0)	0.5951
Age (year)[2]	48.3 ± 10.0	46.9 ± 10.7	0.6427
BMI (kg/m^2)[2]	27.8 ± 3.3	27.5 ± 3.6	0.7961
Sleep onset latency (min)[1]	13.9 (8.1 – 23.1)	16.5 (8.0 – 31.7)	0.8103
Sleep Efficiency Index (%)[1]	88.2 (81.6 – 92.3)	88.0 (83.9 – 92.4)	0.8306
AI (/h)[1]	1.4 (0.1 – 4.1)	2.1 (0.8 – 4.2)	0.2787
HI (/h)[1]	12.3 (8.7 – 18.8)	18.8 (9.3 – 23.2)	0.1683
ArI (/h)[2]	26.5 ± 13.8	25.4 ± 12.2	0.7419
ODI (/h)[1]	4.2 (2.3 – 11.2)	5.2 (3.2 – 10.2)	0.7741
Mean SaO_2 (%)[1]	95.6 (94.1 – 96.1)	94.9 (94.3 – 96.1)	0.7860
Min SaO_2 (%)[1]	86.9 (83.6 – 90.0)	86.0 (84.0 – 88.1)	0.4303
Time SaO_2 < 90% (min)[1]	0.5 (0.0 – 3.4)	1.5 (0.2 – 7.8)	0.1430
AHI supine (/h)[1]	35.3 (18.3 – 53.3)	41.1 (25.3 – 56.6)	0.3369
AHI non supine (/h)[1]	8.9 (4.4 – 16.1)	12.5 (2.8 – 20.6)	0.5981

No significance difference in baseline values was found between both groups. PSG: polysomnography, AHI: apnoea-hypopnea index, VAS: visual analogue snoring scale, ESS: Epworth Sleepiness Scale, BMI: body mass index, AI: apnoea index, HI: hypopnea index, ArI: arousal index, ODI: oxygen desaturation index. [1]:Median (Q1: quartile 1 – Q3: quartile 3) and Mann-Whitney U test, [2]: Mean ± SD and unpaired t-test. Significant values ($p < 0.05$) in bold, nearly significant values ($p < 0.1$) in italics.

Table S2: Baseline and 3 month follow-up patient characteristics.

	COMPLETE DATASET (n = 72)		
Outcome parameter	**Baseline PSG Mean ± SD or Median (Q1 – Q3)**	**Follow-up PSG (3M) Mean ± SD or Median (Q1 – Q3)**	**P-value**
AHI (/h)[1]	15.6 (10.5 – 23.4)	9.0 (5.0 – 15.1)	**< 0.0001**
VAS (1-10)[1]	6.0 (5.0 – 9.0)	6.0 (4.0 – 9.0)	**0.0459**
ESS (1-24)[1]	7.0 (3.8 – 13.0)	6.0 (3.0 – 9.5)	**< 0.0001**
BMI (kg/m²)[2]	27.8 ± 3.3	28.1 ± 3.3	**0.0113**
Sleep onset latency (min)[1]	13.9 (8.1 – 23.1)	13.2 (8.0 – 19.3)	0.2852
Sleep Efficiency Index (%)[1]	88.2 (81.6 – 92.3)	88.1 (82.0 – 91.6)	0.3545
AI (/h)[1]	1.4 (0.1 – 4.1)	0.15 (0.0 – 1.2)	**< 0.0001**
HI (/h)[1]	12.3 (8.7 – 18.8)	8.1 (4.0 – 12.9)	**< 0.0001**
ArI (/h)[1]	23.6 (15.6 – 34.0)	23.1 (14.0 – 32.5)	0.4239
ODI (/h) [1]	4.2 (2.3 – 11.2)	2.0 (0.7 – 4.9)	**< 0.0001**
Mean SaO_2 (%)[1]	95.6 (94.1 – 96.1)	95.3 (94.3 – 95.9)	0.25
Min SaO_2 (%)[1]	86.9 (83.6 – 90.0)	89.0 (86.0 – 91.0)	**0.0020**
Time SaO_2 < 90% (min)[1]	0.5 (0.0 – 3.4)	0.2 (0.0 – 2.4)	*0.0897*
AHI supine (/h)[1]	35.3 (18.3 – 53.3)	12.7 (4.1 – 30.2)	**< 0.0001**
AHI non supine (/h)[1]	8.9 (4.4 – 16.1)	5.0 (3.0 – 90.8)	**0.0010**

AHI: apnoea-hypopnea index, ODI: oxygen desaturation index, BMI: body mass index, VAS: visual analogue snoring scale, ESS: Epworth Sleepiness Scale, AI: apnoea index, HI: hypopnea index, ArI: arousal index. [1]:Median (Q1: quartile 1 – Q3: quartile 3) and Wilcoxon signed rank test, [2]: Mean ± SD and paired t-test. Significant values ($p < 0.05$) in bold, nearly significant values ($p < 0.1$) in italics.

Table S3: Baseline characteristics for responders and non-responders.

	COMPLETE DATASET (n = 72)		
Parameter	**Responders**	**Non-responders**	**P-value**
	Mean ± SD or Median (Q1 – Q3) N = 33	**Mean ± SD or Median (Q1 – Q3) N = 39**	
AHI (/h)[1]	17.3 (11.1 – 25.0)	14.6 (10.5 – 22.6)	0.5416
VAS (1-10)[1]	7.0 (6.0 – 9.0)	6.0 (5.0 – 9.0)	0.1806
ESS (1-24)[1]	7.0 (5.0 – 15.0)	7.0 (4.0 – 11.0)	0.3441
Age (year)[2]	48.2 ± 9.6	48.4 ± 10.3	0.9215
BMI (kg/m²)[2]	28.1 ± 3.0	24.6 ± 3.5	0.4958
Sleep onset latency (min)[1]	11.1 (6.8 – 25.0)	14.6 (10.4 – 21.7)	0.2076
Sleep Efficiency Index (%)[1]	88.4 (81.9 – 92.9)	86.6 (81.2 – 92.2)	0.6841
AI (/h)[1]	0.7 (0.1 – 3.4)	1.4 (0.1 – 4.7)	0.5288
HI (/h)[1]	14.1 (10.1 – 21.8)	11.1 (8.4 – 17.3)	0.1357
ArI (/h)[1]	29.5 (18.9 – 33.5)	19.6 (13.8 – 35.6)	0.1976
ODI (/h)[1]	4.0 (2.2 – 9.2)	3.6 (1.7 – 7.3)	0.7176
Mean SaO_2 (%)[1]	94.9 (94.0 – 95.8)	95.3 (94.3 – 96.0)	0.3964
Min SaO_2 (%)[1]	87.0 (82.5 – 90.0)	89.0 (85.0 – 91.0)	0.9152
Time SaO_2 < 90% (min)[1]	0.2 (0.0 – 6.0)	0.8 (0.0 – 2.2)	0.5724
AHI supine (/h)[1]	28.4 (17.6 – 40.7)	39.0 (20.7 – 61.3)	0.1201
AHI non supine (/h)[1]	9.9 (4.6 – 17.7)	8.9 (4.2 – 14.6)	0.6350

No significant differences were present. AHI: apnoea-hypopnea index, ODI: oxygen desaturation index, BMI: body mass index, VAS: visual analogue snoring scale, ESS: Epworth Sleepiness Scale, AI: apnoea index, HI: hypopnea index, ArI: arousal index. [1]:Median (Q1: quartile 1 – Q3: quartile 3) and Mann-Whitney U test, [2]: Mean ± SD and unpaired t-test.