MEASUREMENT OF SMAS ADVANCEMENT WITH AND WITHOUT ZYGOMATICUS MAJOR MUSCLE RELEASE

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PURPOSE

To determine the comparative amount of movement obtained using two different methods of SMAS release. We present a simple and effective method to measure the length of advancement of the superficial muscular aponeurotic system (SMAS) before and after a back cut release.

MATERIALS AND METHOD

This comparative study was performed on 11 consecutive patients, by the first author, measuring their right and left SMAS flaps during rhytidectomy. Measurements of the vertical advancement (shift) were performed of the release from the Zygomaticus Major Muscle (ZMM), and again after a 3cm back cut was performed along the lateral edge of the ZMM. Measurements were made considering the following anatomical landmarks:

- The vertical advancement of the flap at the lateral edge of the SMAS
- The vertical advancement of the flap at the medial edge (over the ZMM origin) of the SMAS.

Tension force was exerted with the use of a conventional digital fish scale (Rapala Corp., China) at 2 lbs. of weight before and after the back cut was performed.

DRAWING 1: ANATOMICAL POINTS USED TO MEASURE THE LIFT OF THE SMAS VERTICAL ADVANCEMENT FLAP.

POINT 1—VERTICAL LIFT AT THE LATERAL EDGE UNDER TWO POUNDS OF WEIGHT.

POINT 2—VERTICAL LIFT AT THE MEDIAL EDGE OVER THE ZIGOMATICUS MAJOR MUSCLE ORIGIN UNDER TWO POUNDS OF WEIGHT.

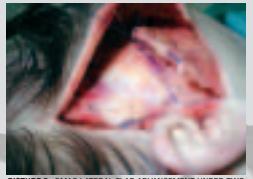
DRAWING 2: AMOUNT OF SMAS VERTICAL ADVANCEMENT MOVEMENT (SHIFT) AFTER THE BACK CUT RELEASE. THE AVERAGE LENGTH GAINED WAS 14.04 MILLIMETERS.

PICTURE 1: DIGITAL FISH SCALE USED TO EXERT THE SAME AMOUNT OF FORCE BEFORE AND AFTER THE BACK CUT ON THE ZMM

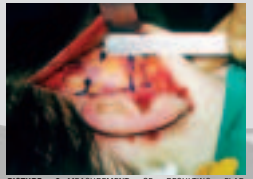
PICTURE 2: SMAS DISSECTION AND EXPOSURE OF ZYGOMATICUS MAJOR MUSCLE

PICTURE 3: BACK CUT RELEASE OF ZYGOMATICUS MAJOR MUSCLE

PICTURE 4: SMAS MEDIAL FLAP ADVANCEMENT UNDER TWO POUNDS OF WEIGHT



PICTURE 5: SMAS LATERAL FLAP ADVANCEMENT UNDER TWO POUNDS OF WEIGHT



PICTURE 6: MEASUREMENT OF RESULTING FLAP ADVANCEMENT LENGTH

NUMBER	SURGERY DATE	AGE	GENDER	SIDE	LATERAL FLAP ADVANCEMENT	AFTER ZMM RELEASE	DIFFERENCE (IN MM)	MEDIAL FLAP ADVANCEMENT	AFTER ZMM RELEASE	DIFFERENCE (IN MM)
1	12/18	45	Female	Left	29	32	+3	20	25	+5
2	12/18	45	Female	Right	29	32	+3	6	25	+19
3	12/19	57	Female	Right	32	39	+7	14	33	+19
4	12/19	57	Female	Left	28	40	+12	33	41	+8
5	12/26	53	Female	Right	25	25	+0	5	29	+24
6	12/26	53	Female	Left	25	30	+5	17	29	+12
7	12/30	59	Female	Right	28	29	+1	24	4	+10
8	12/30	59	Female	Left	26	27	+1	13	25	+12
9	12/30	54	Female	Right	11	24	+13	15	21	+6
10	12/30	54	Female	Left	25	8	+3	19	25	+6
11	12/31	58	Female	Right	36	37	+1	16	39	+23
12	12/31	58	Female	Left	28	28	+0	15	25	+10
13	01/02	60	Female	Right	42	46	+4	40	55	+15
14	01/02	60	Female	Left	34	34	+0	29	40	+11
15	01/06	54	Female	Right	16	22	+6	2	32	+30
16	01/06	54	Female	Left	28	29	+1	18	30	+12
17	01/08	57	Female	Right	31	33	+2	16	30	+14
18	01/08	57	Female	Left	21	23	+2	7	26	+19
19	01/13	60	Male	Right	34	34	+0	21	39	+18
20	01/13	60	Male	Left	19	24	+5	20	33	+13
21	01/15	59	Male	Right	17	26	+9	15	27	+12
22	01/15	59	Male	Left	15	15	+0	13	24	+11
				Average	26.3	29.8	3.5	17.1	29.8	+14.04

The medial SMAS movement increased an average of 14.04mm after the ZMM release, allowing more movement of the SMAS at the jowl. The photographs above illustrate the results in patients before and after these measurements.

RESULTS

The table to the left illustrates the results of the SMAS advancement (shift) in millimeters obtained with and without zygomaticus major muscle release. An average of 14.04mm of additional advancement was gained by releasing the SMAS from the ZMM.

CONCLUSION

We believe this is a particular interesting finding, because it explains and quantifies the increased medial SMAS advancement, which therefore improves the cosmetic appearance of the jowl and midface.

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