

Comparing long-term patient-reported outcomes after cranial vault remodeling and strip craniectomy with the FACE-Q Craniofacial Module—a single-center retrospective study

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# Disclosures

The authors do not have any disclosures to make.

# Craniosynostosis (premature suture fusion)



Sagittal



Coronal



Metopic



Lambdoidal

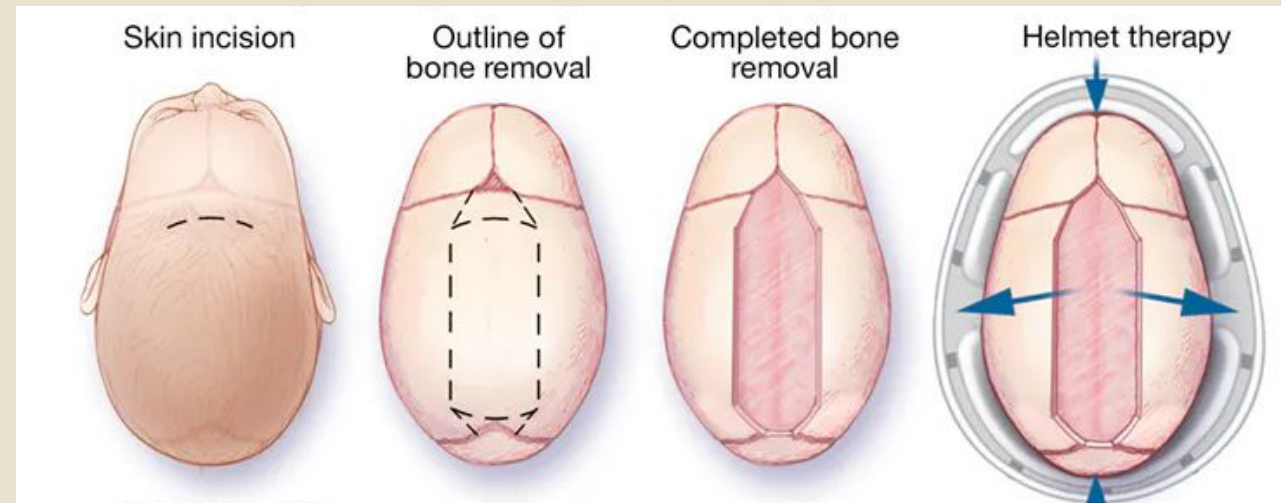


# Two Methods of Craniosynostosis Repair

## Total Cranial Vault Remodeling



## Strip Craniectomy



From: Chim et al. 2014 (Left) and Mayo Clinic (above)

# “Early open” vs endoscopic strip craniectomy

## Early Open strip craniectomy

- Biparietal and occipital barrel staving
- Does not require helmeting

## Endoscopic strip craniectomy

- Includes helmeting after procedure

# Hypothesis

There is no difference in patient reported outcomes between patients who underwent SC and those who underwent CVR/FOA for single suture craniosynostosis.



# FACE-Q Craniofacial Model

## **Aesthetic Domains**

- Face
- Eyes
- Forehead
- Head
- Nose

## **Health-Related Domains**

- Appearance distress
- Psychological
- School
- Social



FACE-Q

# Results – Patient characteristics

Total Survey Responses: 62  
Survey Response Rate: 33.3%

	Total (N = 58)	Early open strip craniectomy (n = 25)	Total cranial vault remodeling/fronto-orbital advancement (n = 33)	p value
Age at surgery, in years				< 0.001
Median (IQR)	0.59 (0.25–0.80)	0.25 (0.24–0.30)	0.72 (0.65–1.14)	
	N (%)	n (%)	n (%)	
Race				< 0.01
Black	9 (14.5%)	0 (0.0%)	9 (27.3%)	
Not answered/Unknown	1 (1.7%)	0 (0.0%)	1 (3.0%)	
White	48 (82.8%)	25 (100.0%)	23 (69.7%)	
Diagnosis				< 0.01
Unicoronal	7 (12.1%)	0 (0.0%)	7 (21.2%)	
Metopic	9 (15.5%)	0 (0.0%)	9 (27.3%)	
Sagittal	42 (72.4%)	25 (100.0%)	17 (51.5%)	
Re-operation required?				0.02* (3)
No	51 (87.9%)	25 (100.0%)	26 (78.8%)	
Yes	7 (12.1%)	0 (0.0%)	7 (21.2%)	
Length of follow-up (in years)				0.13 (1)
Median (IQR)	5.4 (3.8– 6.3)	5.3 (3.4–6.2)	5.6 (4.3–6.5)	

# Results - Bivariate analysis

	Total (N = 62)	Strip craniectomy (n = 29)	Total cranial vault remodeling/fronto-orbital advancement (n = 33)	p value
	Median (IQR)	Median (IQR)	Median (IQR)	
Eyes	91 (64–100)	100 (84–100)	79 (59.8–100)	0.01*
Face	100 (79–100)	100 (91–100)	95.5 (68.3–100)	0.07
Forehead	100 (60.5–100)	100 (91–100)	84 (58–100)	0.03*
Head	83 (63–100)	90 (77–100)	83 (59–100)	0.17
Nose	100 (93.3–100)	100 (100–100)	100 (81–100)	0.45
Appearance Distress	100 (91–100)	100 (100–100)	100 (91–100)	0.89
Psychological Function	100 (76–100)	100 (76–100)	100 (76–100)	0.97
School Function	100 (73–100)	100 (68.5–100)	100 (73–100)	0.90
Social Function	100 (76–100)	100 (76–100)	91 (76–100)	0.29

# Results – Multiple linear regression by surgery type

FACE-Q domain and variables included in multiple linear regression	Estimates	p-value
<b>Eyes</b>		
Strip craniectomy	Ref	
Total Cranial vault remodeling/fronto-orbital advancement	-6.49	0.29
<b>Face</b>		
Strip craniectomy	Ref	
Total Cranial vault remodeling/fronto-orbital advancement	0.51	0.91
<b>Forehead</b>		
Strip craniectomy	Ref	
Total Cranial vault remodeling/fronto-orbital advancement	3.18	0.67
<b>Head</b>		
Strip craniectomy	Ref	
Total Cranial vault remodeling/fronto-orbital advancement	-0.49	0.94
<b>Nose</b>		
Strip craniectomy	Ref	
Total Cranial vault remodeling/fronto-orbital advancement	3.89	0.41

FACE-Q domain and variables included in multiple linear regression	Estimates	p-value
<b>Appearance Distress</b>		
Strip craniectomy	Ref	
Total Cranial vault remodeling/fronto-orbital advancement	-0.54	0.88
<b>Psychological Function</b>		
Strip craniectomy	Ref	
Total Cranial vault remodeling/fronto-orbital advancement	-1.59	0.79
<b>School Function</b>		
Strip craniectomy	Ref	
Total Cranial vault remodeling/fronto-orbital advancement	-0.17	0.98
<b>Social Function</b>		
Strip craniectomy	Ref	
Total Cranial vault remodeling/fronto-orbital advancement	-0.50	0.94

# Results – Multiple linear regression by craniosynostosis type

FACE-Q domain and variables included in multiple linear regression		Estimates	p-value
<b>Eyes</b>			
Unicoronal		Ref	
Metopic		21.15	0.02*
Sagittal		24.01	0.004*
<b>Face</b>			
Unicoronal		Ref	
Metopic		17.34	0.01*
Sagittal		27.20	<0.001*
<b>Forehead</b>			
Unicoronal		Ref	
Metopic		18.49	0.10
Sagittal		43.53	<0.001*
<b>Head</b>			
Unicoronal		Ref	
Metopic		35.25	0.001*
Sagittal		37.21	<0.001*
<b>Nose</b>			
Unicoronal		Ref	
Metopic		14.08	0.053
Sagittal		17.56	0.008*

# Results - Subgroup analysis of sagittal patients only

	Total (N = 42)	Strip craniectomy (n = 25)	Total cranial vault remodeling/fronto-orbital advancement (n = 17)	p value
<b>FACE-Q domains</b>	Median (IQR)	Median (IQR)	Median (IQR)	
Eyes	100 (84–100)	100 (84–100)	92 (64–100)	0.26
Face	100 (91–100)	100 (91–100)	100 (100–100)	0.47
Forehead	100 (91–100)	100 (91–100)	100 (91–100)	1.00
Head	90 (73.25–100)	90 (77–100)	90 (72–100)	0.97
Nose	100 (100–100)	100 (100–100)	100 (100–100)	0.55
Appearance Distress	100 (93.25–100)	100 (100–100)	100 (91–100)	0.91
Psychological Function	100 (77–100)	100 (76–100)	100 (84–100)	0.93
School Function	100 (68.50–100)	100 (68.50–100)	100 (70–100)	0.96
Social Function	100 (76–100)	100 (76–100)	100 (76–100)	0.64

# Results – Multiple linear regression of sagittal synostosis subgroup

FACE-Q domain and variables included in multiple linear regression	Estimates	p-value
<b>Eyes</b>		
Strip craniectomy	Ref	
Total Cranial vault remodeling/fronto-orbital advancement	-5.25	0.43
<b>Face</b>		
Strip craniectomy	Ref	
Total Cranial vault remodeling/fronto-orbital advancement	1.58	0.75
<b>Forehead</b>		
Strip craniectomy	Ref	
Total Cranial vault remodeling/fronto-orbital advancement	4.76	0.56
<b>Head</b>		
Strip craniectomy	Ref	
Total Cranial vault remodeling/fronto-orbital advancement	2.09	0.77
<b>Nose</b>		
Strip craniectomy	Ref	
Total Cranial vault remodeling/fronto-orbital advancement	5.91	0.21

FACE-Q domain and variables included in multiple linear regression	Estimates	p-value
<b>Appearance Distress</b>		
Strip craniectomy	Ref	
Total Cranial vault remodeling/fronto-orbital advancement	-1.57	0.71
<b>Psychological Function</b>		
Strip craniectomy	Ref	
Total Cranial vault remodeling/fronto-orbital advancement	-3.67	0.57
<b>School Function</b>		
Strip craniectomy	Ref	
Total Cranial vault remodeling/fronto-orbital advancement	-4.50	0.54
<b>Social Function</b>		
Strip craniectomy	Ref	
Total Cranial vault remodeling/fronto-orbital advancement	-3.71	0.58

# Conclusion

Cranial Vault Remodeling and Strip Craniectomy produce aesthetic results and quality of life outcomes that are equivalent for sagittal synostosis.