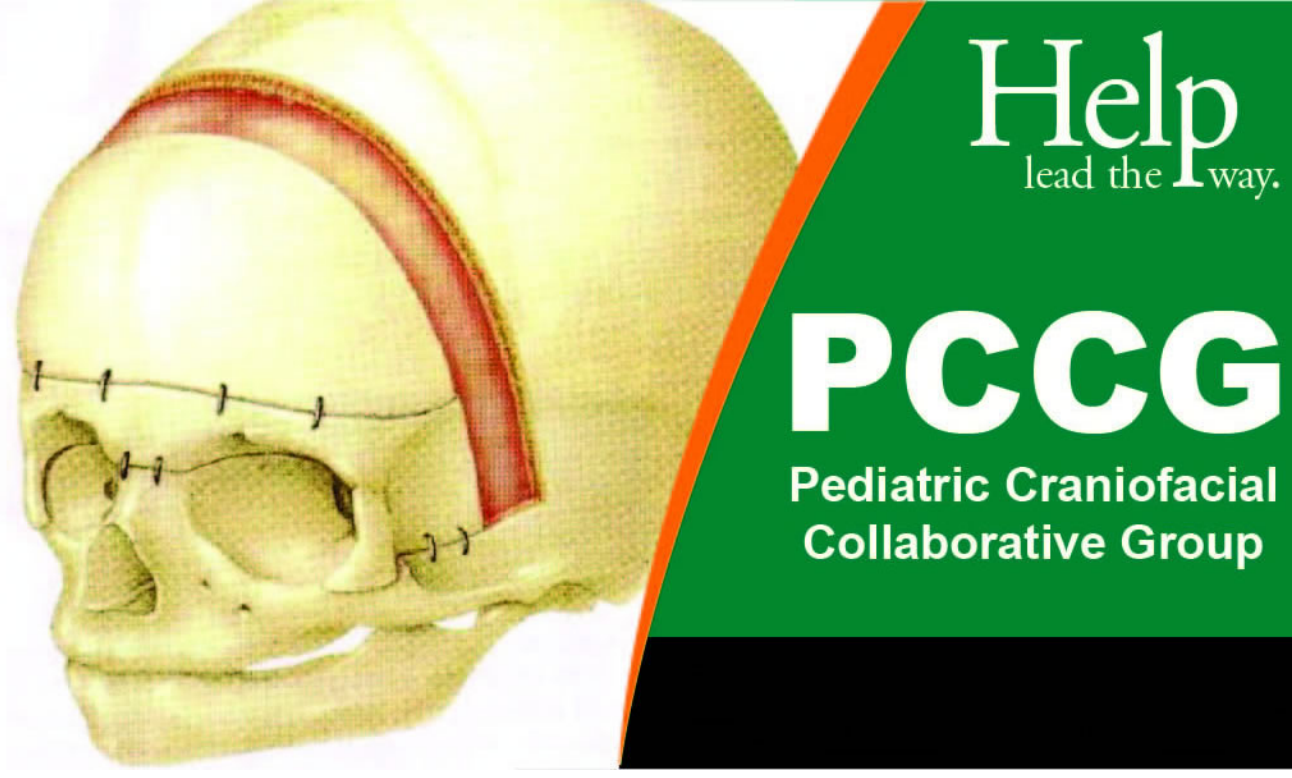


Predictors of Transfusion Outcomes in Pediatric Complex Cranial Vault Reconstruction (CCVR)

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Background

- Pediatric CCVR patients are at risk for significant blood loss resulting in perioperative blood product transfusion.
- Given the risks and cost of allogenic blood transfusion, minimizing blood loss and transfusion are important goals
- Various strategies are often employed to minimize blood product exposure; however, the impact of patient and surgical variables on transfusion is unknown.
- We evaluated independent associations of demographic and perioperative variables with transfusion outcomes in CCVR.

Methods

- Query for CCVR in the PCCG registry
- Demographic and perioperative data collected from 33 institutions over a 5 year period
- 3 transfusion outcomes analyzed:
 1. Intraoperative RBC-containing product (IRBC-CP) transfusion
 2. Total perioperative blood donor exposures (BDE)
 3. Transfusion-free hospital course (TFH)
- Variables related to patient, procedure and blood conservation technique were analyzed

Results

Predictors of intraoperative RBC-product transfusion	LS mean	SE	lower 95% CI	upper 95% CI	p value
Patient variable					
Age					
≤24 mo	3.65	0.13	3.39	3.91	
>24 mo	3.28	0.14	3.01	3.56	<0.0001
Weight (kg) tertile					
1 (3.2 -8.6)	3.67	0.14	3.40	3.94	
2 (8.57-10.9)	3.45	0.14	3.18	3.72	<0.0001
3 (11-129)	3.28	0.14	3.02	3.55	<0.0001
ASA Physical Status:					
1-2	3.36	0.14	3.10	3.63	
3-4	3.57	0.13	3.31	3.83	0.002
Procedure variable					
Distractor Placement					
No	3.61	0.13	3.36	3.87	
Yes	3.32	0.14	3.04	3.60	<.0001
Duration of surgery median split (minutes)					
Below median (44-225)	3.25	0.14	2.98	3.51	
Above median (226-725)	3.69	0.13	3.43	3.95	<.0001
Intraop vasoactive infusion					
No	3.34	0.13	3.08	3.60	
Yes	3.59	0.15	3.31	3.88	0.006
Major intraoperative cardiorespiratory complication					
No	3.31	0.13	3.06	3.57	
Yes	3.62	0.15	3.32	3.92	0.0009
Blood Conservation Variable					
Antifibrinolytic					
No	3.55	0.14	3.28	3.83	
Yes	3.38	0.13	3.12	3.64	0.009

LS mean: least squares mean, SE: standard error, CI: confidence interval

1,814 cases analyzed

- 75% were <24 months old
- 90% received intraoperative RBCs

Predictors of increased blood donor exposure

Age > 24 months
Tracheostomy
Distractor Placement
Surgery > 225 min
Total cranial vault reconstruction

Predictors of a transfusion-free hospitalization

Age > 24 months (OR 4.5)
Weight > 11kg (OR 3.5)
Preop HCT > 35 (OR 2.7)
Intraoperative cell saver (OR 4.6)
Postop transfusion protocol (OR 2.2)
ASA status > 3 (OR 0.42)
Surgery > 225 min (OR 0.25)

Conclusions

Interventions with potential to decrease blood product transfusion in pediatric CCVR include:

1. Preoperative optimization of hematocrit
2. Use of intraoperative cell saver
3. Utilization of antifibrinolytics intraoperatively
4. Institution of a postoperative transfusion protocol
5. Consider postponing surgery until age > 24 months and/or weight > 10kg

These interventions should be prospectively evaluated

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