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Preliminary Program

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A NOVEL MODEL OF US METROPOLITAN PEDIATRIC SURGEON DENSITY

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THE EVIDENCE ON EVIDENCE-BASED MEDICINE DECISION MAKING AMONG PEDIATRIC SURGEONS

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SCREENING FOR INTIMATE PARTNER VIOLENCE IN THE PEDIATRIC SURGERY CLINIC: A FEASIBILITY STUDY

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SOCIAL SCREENING IN PEDIATRIC SURGERY CLINICS WITHIN A TERITARY CHILDREN'S HOSPITAL

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PEDIATRIC OBESITY IN THE USA: LOWER SOCIOECONOMIC STATUS MAY LEAD TO INADEQUATE TREATMENT

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WHEN PRIMARY REPAIR IS NOT ENOUGH: A COMPARISON OF SYNTHETIC PATCH VERSUS MUSCLE FLAP REPAIR FOR LARGE CONGENITAL DIAPHRAGMATIC HERNIA

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When primary repair is not enough: A comparison of synthetic patch versus muscle flap repair for large congenital diaphragmatic hernia

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Background

- Congenital Diaphragmatic Hernia (CDH) occurs in 1 in 3,000-4,000 live births[1]
- While small defects can be repaired primarily, large defects require a prosthetic patch or muscle flap to bridge the gap
- Few studies compare techniques head to head and evaluate durability
- **Goal: Describe our experience with prosthetic patch and muscle flap repairs for large defect CDH and evaluate diaphragmatic reherniation**

Methods

- Retrospective analysis
- 2005 to 2016
- Electronic medical record review and phone call follow-up
- Patch of GORE-TEX® or DUALMESH®
- Muscle flap of transversus abdominis with or without internal oblique

Results

- 171 CDH repairs, 151 survived to discharge, 131 long term
  - -119 open: 28 primary, 34 patch, 57 flap
- Patch vs Flap
  - -similar patient characteristics (Table 1)
  - -comparable operative data (Table 2)
  - -low recurrence rates (Table 3)

Table 1

	Patch (n=34)	Flap (n=57)	p
Patient characteristics			
Gestational age at delivery (weeks)	37.41 ± 1.87	37.23 ± 1.85	0.657
Gender (male)	18 (52.9%)	31 (54.4%)	0.894
Birth weight (grams)	2908 ± 536	2853 ± 562	0.647
Maternal age (years)	28.82 ± 6.64	28.44 ± 6.52	0.787
Delivery type			0.891
Vaginal	11 (32.4%)	21 (36.8%)	0.664
Cesarean section	22 (64.7%)	34 (59.6%)	0.631
EXIT	1 (2.9%)	2 (3.5%)	0.883
Diagnosed syndrome	1 (2.9%)	7 (12.3%)	0.128
chromosomal abnormality	0	4 (7.0%)	0.114
Presence of comorbidity	8 (23.5%)	11 (19.3%)	0.631
Prenatal diagnosis	27 (79.4%)	52 (91.2%)	0.107
Hernia characteristics			
Left sided CDH	**19 (55.9%)**	**49 (86.0%)**	**0.001**
diaphragmatic hernia sac	6 (17.6%)	7 (12.3%)	0.479
CDH study group type			0.939
B	8 (23.5%)	12 (21.1%)	0.783
C	18 (52.9%)	30 (52.6%)	0.977
D	8 (23.5%)	15 (26.3%)	0.767
Liver up	24 (77.4%)	38 (66.7%)	0.291
LHR	1.13 ± 0.45	1.19 ± 0.49	0.628
O/E LHR	27.93 ± 10.86	28.66 ± 10.08	0.789

Values expressed as means ± standard deviations or counts (percentage of the group)
EXIT, ex utero intrapartum treatment; CDH, congenital diaphragmatic hernia; LHR, lung-to-head ratio; O/E LHR, observed to expected lung-to-head ratio.

Discussion

- When more than primary repair is required, there is no consensus on techniques for repair
- Both patch and flap are often compared to primary repair
  - -Not a reliable comparison
  - -Is a surrogate for larger defect size
- Two studies evaluate techniques side-by-side [1,2]
  - -sample sizes are small
  - -recurrence noted in both groups
    - ▫Nasr: 2/19 flap and 8/32 patch
    - ▫Barnhart:1/23 flap and 5/10 patch
- Our results are one of the largest series available in the literature with one of the longest follow-up time frames
  - **-low recurrence in both groups**
  - **-both are effective and durable**

Table 2

	Patch (n=34)	Flap (n=57)	p
Operative characteristics			
Age at operation (day-of-life)	16.18 ± 13.38	14.25 ± 11.12	0.460
Surgery time (minutes)	252.89 ± 71.50	253.57 ± 69.22	0.967
Blood loss (milliliters)	11.22 ± 6.82	18.18 ± 17.58	0.051
Outcome			
ECMO during hospitalization	11 (32.4%)	20 (35.1%)	0.790
Repaired on ECMO	9 (26.5%)	17 (29.8%)	0.732
Age at ECMO cannulation (days)	1.09 ± 0.30	3.25 ± 7.99	0.382
Duration on ECMO (days)	11.45 ± 3.17	9.95 ± 4.63	0.346
Age at extubation (days)	32.13 ± 18.28	50.67 ± 66.53	0.195
Length of stay (days)	86.97 ± 49.87	103.78 ± 72.23	0.273
Hernia recurrence (patients)	3 (8.8%)	2 (3.5%)	0.295
Hernia recurrence time (months)	6.00 ± 0.00	57.00 ± 72.13	0.272

Values expressed as means ± standard deviations or counts (percentage of the group)
ECMO, extracorporeal membrane oxygenation.

Table 3

		Prosthetic Patch			Muscle Flap	
		P1	P2	P3	F1	F2
Day of life at initial repair		8 days	6 days	22 days	7 days	18 days
Side of defect		Left	Right	Right	Left	Left
CDH group classification		Type B	Type C	Type C	Type C	Type C
Initial repair		Laparotomy, GORE-TEX Patch	Thoracotomy, GORE-TEX Patch	Laparotomy, GORE-TEX Patch	Laparotomy, Transversus Abdominis Muscle Flap	Laparotomy, Transversus Abdominis & Internal Oblique Muscle Flap
1st Recurrence	Time from initial repair	6.2 months	5.5 months	5.6 months	103.8 months	3.5 months
	Location of recurrence	Posterolateral	Posterior	Posterior	Medial	Posterolateral
	Repair	Thoracoscopy, Simple	Thoracotomy, Additional GORE-TEX	Laparotomy, Additional GORE-TEX	Laparoscopy, Surgisis	Thoracoscopy, GORE-TEX
2nd Recurrence	Time from second repair	5.6 months	Not applicable			
	Location of recurrence	Medial aspect of patch				
	Repair	Laparotomy, Additional GORE-TEX				
Age at study completion		2 years 1 month	3 years 8 months	8 years 3 months	11 years 8 months	1 year 4 months

Conclusion

- **For large defect CDH recurrence rates are similar for prosthetic patch and muscle flap repair**

References

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