

JOURNAL CLUB SUMMARY

1/7/04 – GASTROSCHISIS

(attendees: Breuer, Moss, Touloukian, McKee, Tashjian, Chen, Khan, Jose, Johnson, Anthony, Goyal, Henry)

- I. Moore TC, Collins DL, Catanzarite V, Hatch EI Jr. Pre-term and particularly pre-labor cesarean section to avoid complications of gastroschisis

Presented by Michael Chen, MD

Reported	Not App.	REPORTING DETAIL – METHODS SECTION	Comments
yes		A clear description of study design	A retrospective case series
yes		The number and practice type of institutions where cases were performed	Single center
Yes		Number of surgeons who actually operated in study	Three surgeons
No		A statement as to whether the same surgeon operated on pts from different treatment groups or just one group	
no		The precise timeline during which patients were treated	
No		A clear description of how patients were selected into study	
no		The number of eligible patients at the study sites excluded during the study	
yes		A clear description of the study population	
yes		A clear description of the relevant diagnostic criteria used to identify cases	
no		A clear description of critical aspects of operative technique and peri-operative care	
No		Statement as to whether any attempts were made to standardize operative technique or peri-operative care	
		RESULTS	
no		Range and mean of all relevant demographic and baseline variables	See summary
no		Range and median for length of follow-up reporting	“
no		Relevant outcome variables are presented with appropriate measures of range and variability	
no		Methods for measuring outcomes of interest are clearly described	
no		Statement is made whether data is missing (and how missing data is addressed)	
yes		Number and appropriate details regarding all complications	
		IF MORE THAN ONE TREATMENT GROUP	
no		Mean and range for all relevant demographic and baseline variables for all treatment groups	
no		The range and median for length of follow-up reporting for each treatment group	
no		A precise timeline during which all patients were treated for each group	
no		Outcome variables being compared between groups are presented with appropriate measures of variability (eg standard deviation)	
no		Measure of type I error: (p-values) for comparison statistics are presented with actual values if p=0.01 or larger (eg. P=NS and p<0.05 are not acceptable).	
no		Type I error cont: Confidence interval presented	
no		Measures of type II error should not be >0.2 (study should have at least 80% power)	
no		A description of how patients were selected into each treatment group	
no		A statement is made as to whether the same surgeons operated on patients from different treatment groups	

Summary: 33 born via preterm, prelabor (PTPL) cesarean section compared to 44 born after onset of labor, either by vaginal delivery or c-section.

None of the 33 in the treatment group and all of the 44 in the control group had a peel formation

The comparison group then changes, and the 33 patients born by PTPL are compared to 320 reported cases of babies born by various other means.

PTPL group - 1 single case of atresia (3%)

Larger comparison group – 29 cases of atresia (9.1%)

The remainder of the paper presents a review of the literature (case series) on this topic.

Table 1: Incidence of peel formation in their two groups of patients: 100% non-PTPL patients vs 0% PTPL patients

Table 2: Occurrence of complications in 320 cases reported in the literature.

16/320 NEC 29/320 atresia 5/320 perforation 5/320 gangrene

Table 3: Occurrence of complications in 33 cases of PTPL

1/33 atresia

Table 4: Data from a presented abstract comparing PTPL vs non preterm delivery

N=16 each group

0% bowel compromise, need for silo or wound complications in PTPL group

70% bowel compromise, 77% need for silo, 23% wound complications in nonpreterm delivery group

Discussion: This paper is a report of personal experience with a procedure accompanied by a review of the literature. The first problem with the paper is the comparison groups. Initially a group of 44 patients from the same sites, defined as the treatment group received prenatal care while the comparison group may not have. The differences between women who receive prenatal care and those who don't are substantial and these differences may role play a large confounding role in the differences in outcome found between these two groups. The comparison group is then expanded to include 320 cases reported in the literature. This increases the likelihood of significant differences between the treatment and the control group. The data presented in tables 2 and 3 highlights these potential differences. Intestinal atresia is believed to result from an incident early in fetal development, not from a late third trimester event during labor. The different incidence of atresias in these two groups, therefore, suggests that these groups are potentially very different in characteristic. Another difficulty with this study is that all of the outcomes are subjective and the study is not blinded. These characteristics leave much room for bias to be introduced. Finally, much of the data consists of absolutes – 100% and 0%. These absolute values are difficult to accept, given their significant variance with other reports in the literature. In summary, the paper raises provocative questions but does not provide data sufficient to answer them.

II. Segal SY, Marder SJ, Parry S, Macones GA. Fetal abdominal wall defects and mode of delivery: a systematic review. *Obstet Gynecol* 98:867-73, 2001.

Presented by Marion Henry, MD

Reported	Not App.	REPORTING DETAIL – METHODS SECTION	Comments
yes		A clear description of study design	A systematic review of all trials and observational studies
	NA	The number and practice type of institutions where cases were performed	
	NA	Number of surgeons who actually operated in study	
	NA	A statement as to whether the same surgeon operated on pts from different treatment groups or just one group	
	NA	The precise timeline during which patients were treated	
yes		A clear description of how studies were selected into study	Predetermined inclusion criteria for studies were reported
yes		The number of eligible studies excluded during the study	Excluded studies described
	NA	A clear description of the study population	
	NA	A clear description of the relevant diagnostic criteria used to identify cases	
	NA	A clear description of critical aspects of operative technique and peri-	

		operative care	
	NA	Statement as to whether any attempts were made to standardize operative technique or peri-operative care	

Summary: This systematic review selected clinical trials and observational studies (not including case series) assessing neonatal outcomes of infants delivered either vaginally or by cesarean section with a diagnosis of either gastroschisis or omphalocele. The study adequately addressed the potential for confounding by the fact that these studies involved both children who were prenatally diagnosed and those who were not, as well as children who were inborn at a tertiary care center and those who were not. The systematic review examined several outcomes: 1) the ability to perform a primary fascial repair, 2) the differences in incidence of sepsis, necrotizing enterocolitis, ischemic bowel and SBO, and 3) the time until initiation of feeds, length of hospital stay and 4) mortality. Of 27 studies identified that addressed the topic, two were excluded because they were case series and ten were excluded because the actual numerators and denominators for the outcome variables could not be determined.

Results: A total of 805 subjects were included in the 15 retrospective studies used. There were NO randomized trials. 5 of the studies included both omphalocele and gastroschisis, the other ten examined only gastroschisis patients. 12 of the 15 studies discussed the rates of prenatal diagnosis. (Table 1) Most of the studies included mortality, ability to perform primary repair and sepsis rates in their analysis. Very few mentioned the incidence of ischemic bowel, SBO, or NEC. (Table 2) One-third discussed length to feeding and 60% discussed length of stay. (Table 3)

Figure 1: Meta-analysis of the data for rate of primary repair. There was no difference between cesarean section and vaginal delivery on rate of primary fascial repair (RR 1.22 with 95% CI of 0.99-1.51).

Figure 2: Meta-analysis of the data for relative risk of sepsis. There was no relationship between either method of delivery and neonatal sepsis. (RR 0.7 with 95% CI 0.3-1.62).

Figure 3: Meta-analysis of the data for relative risk of mortality. There was no difference in rates of mortality between the two methods of delivery. (RR 1.14 with 95% CI 0.59-2.21).

Discussion: This systematic review has attempted to find the best evidence available in light of the absence of randomized trials. Unfortunately, even with the inclusion of observational studies, many studies were excluded because of inadequate reporting of data. The fact that more than a third of the potential studies were excluded due to inadequate reporting of the data reflects the state of the literature. It also means that there is a significant amount of data that could not be included in this systematic review. These results may have impacted the outcomes of the meta-analysis, particularly pertaining to the rate of primary repair since these results approached significance. The authors adequately discuss the limitations of meta-analysis in their discussion of confounding factors, limitations due to publication bias and study quality and the possibility of type II error. One additional concern with this study is the inclusion of both cases of gastroschisis and omphalocele as these are two different processes with potentially different outcomes. Another concern is that these studies did not differentiate between elective and non-elective cesarean sections. The difference between these two situations could well be clinically significant and add confounders to this question.

In conclusion, this study was a well-done systematic review. The results of this study do not support improved outcomes for infants with abdominal wall defects who undergo a cesarean delivery rather than a vaginal delivery. Given the limitations to this review, however, further research through well-designed clinical may be indicated.

- III. Schlatter M, Norris K, Uitvlugt N, DeCou J and Connors R. Improved outcomes in the treatment of gastroschisis using a preformed silo and delayed repair approach. J Pediatr Surg 38(3):459-464, 2003.

Presented by Shaher Khan, MD

Reported	Not App.	REPORTING DETAIL – METHODS SECTION	Comments
Yes		A clear description of study design	Retrospective case series with historical control
Yes		The number and practice type of institutions where cases were performed	Single institution
No		Number of surgeons who actually operated in study	Not mentioned
no		A statement as to whether the same surgeon operated on pts from different	No

		treatment groups or just one group	
yes		The precise timeline during which patients were treated	1991-2000
yes		A clear description of how patients were selected into study	All patients during this time
yes		The number of eligible patients at the study sites excluded during the study	# excluded is mentioned but not why
no		A clear description of the study population	All children with gastroschisis
no		A clear description of the relevant diagnostic criteria used to identify cases	No
yes		A clear description of critical aspects of operative technique and peri-operative care	Referenced other study
no		Statement as to whether any attempts were made to standardize operative technique or peri-operative care	
		RESULTS	
yes		Range and mean of all relevant demographic and baseline variables	See summary
No		Range and median for length of follow-up reporting	
yes		Relevant outcome variables are presented with appropriate measures of range and variability	
no		Methods for measuring outcomes of interest are clearly described	
no		Statement is made whether data is missing (and how missing data is addressed)	
yes		Number and appropriate details regarding all complications	
		IF MORE THAN ONE TREATMENT GROUP	
yes		Mean and range for all relevant demographic and baseline variables for all treatment groups	
no		The range and median for length of follow-up reporting for each treatment group	
yes		A precise timeline during which all patients were treated for each group	
yes		Outcome variables being compared between groups are presented with appropriate measures of variability (eg standard deviation)	
yes		Measure of type I error: (p-values) for comparison statistics are presented with actual values if p=0.01 or larger (eg, P=NS and p<0.05 are not acceptable).	
No		Type I error cont: Confidence interval presented	
no		Measures of type II error should not be >0.2 (study should have at least 80% power)	
no		A description of how patients were selected into each treatment group	
no		A statement is made as to whether the same surgeons operated on patients from different treatment groups	

Summary: This is a retrospective review examining methods of treatment over two different time periods. Given that these different methods were used in different time periods, it is possible that some of the differences may be due to practice changes in these two eras rather than to the different operative method.

Table 1: Demographic data for the two groups shows that the infants were of similar gestational age and birthweight.

Table 2: Outcome comparisons between the two groups. Infants treated with a silo were on the ventilator for a shorter period of time (1 vs 4 days), were fed sooner (11 vs 21 days), reached full feeds sooner (19 vs 34 days), received fewer paralytics, and had fewer central line infections (3 vs 19). There was no significant difference between the two groups in the number of episodes of NEC (7 for the emergent surgery group and 2 for the silo group), the number of re-operations (12 in the emergent surgery group and 4 in the silo group) or for the mean length of stay (40 days for the emergent surgery group vs 28.5 days for the silo group).

Discussion: Several issues suggest caution in the use of these data to guide clinical practice. The first is that the comparison between these two different types of treatments is done in two different time periods. Differences in neonatal management between these two eras may explain some of the differences which were noted in the analysis. The use of paralytics and the

rapidity with which feeds are advanced may well be practices which changed over time. The authors comment that their results may differ from those in other series due to practice differences in technique of placing the silo, less use of paralytics and less time on the ventilator. It is conceivable that one or two technical differences in management such as a reduced use of paralytics could influence all of the outcomes described such as length of time requiring a central line for TPN as feeds are delayed due to prolonged ileus. The authors do conclude that a prospective study would provide better answers for optimizing treatment though they suggest that such a study is harder to do, given their good outcomes. The absence of a concurrent control group or adoption of a protocol of post-operative care uniformly applied to both groups makes it difficult to judge the relative merits of each approach.

- IV. Kidd JN Jr, Jackson RJ, Smith SD, and Wagner CW. Evolution of staged versus primary closure of gastroschisis. *Annals of Surgery* 237(6): 759-765, 2003.

Presented by David Tashjian, MD

Reported	Not App.	REPORTING DETAIL – METHODS SECTION	Comments
No		A clear description of study design	Retrospective case series with historical control
Yes		The number and practice type of institutions where cases were performed	Single institution
No		Number of surgeons who actually operated in study	
No		A statement as to whether the same surgeon operated on pts from different treatment groups or just one group	
Yes		The precise timeline during which patients were treated	1993-2002
Yes		A clear description of how patients were selected into study	All-comers
Yes		The number of eligible patients at the study sites excluded during the study	Reported with reasons for exclusion
Yes		A clear description of the study population	
Yes		A clear description of the relevant diagnostic criteria used to identify cases	Explains reasons for selecting specific treatment
Yes		A clear description of critical aspects of operative technique and peri-operative care	References their own previous description of technique
No		Statement as to whether any attempts were made to standardize operative technique or peri-operative care	
		RESULTS	
No		Range and mean of all relevant demographic and baseline variables	No demographics given
No		Range and median for length of follow-up reporting	No length of follow-up reported
Yes		Relevant outcome variables are presented with appropriate measures of range and variability	
No		Methods for measuring outcomes of interest are clearly described	
No		Statement is made whether data is missing (and how missing data is addressed)	
yes		Number and appropriate details regarding all complications	
		IF MORE THAN ONE TREATMENT GROUP	
yes		Mean and range for all relevant demographic and baseline variables for all treatment groups	
no		The range and median for length of follow-up reporting for each treatment group	
no		A precise timeline during which all patients were treated for each group	
yes		Outcome variables being compared between groups are presented with appropriate measures of variability (eg standard deviation)	
yes		Measure of type I error: (p-values) for comparison statistics are presented with actual values if p=0.01 or larger (eg. P=NS and p<0.05 are not acceptable).	
	NA	Type I error cont: Confidence interval presented	
no		Measures of type II error should not be >0.2 (study should have at least 80% power)	

no		A description of how patients were selected into each treatment group	
no		A statement is made as to whether the same surgeons operated on patients from different treatment groups	

Summary: This study is a retrospective review of the experience of a single institution with two different methods of treating gastroschisis. Their two methods were also mainly used during two different time periods, although there is some overlap. The study compares outcomes of length of hospital stay, length on ventilator, days to enteric feeds, need for re-operation and complications of stricture, NEC, infection and death.

Result Summary: 118 of 124 patients treated for gastroschisis between 1993 and 2002 were included in the study. The 6 excluded cases had other serious diagnoses. The first group was cared for between 1993 and 1997. In this group 84% received primary closure and 16% underwent silo closure. During the subsequent time period (1998-2002), this group of surgeons tended to use more silo closure and the percentages shifted, with 34% receiving primary closure and 66% undergoing silo closure. Thus, if looked at by time period (this is the case in Table 2), the earlier time period consisted of mainly primary closure with very few silo closures while the later period shifts toward silo closure. However, if broken down by closure method, there is more overlap in the time periods.

Table 1: This table looks at outcomes broken down by treatment method. Of note, the numbers in this table do not match the numbers in the text, as there is one additional primary closure patient noted in the text and one less silo closure patient mentioned in the text. There were 58 or 59 patients treated by primary closure. If you separate these into time periods, 55% were treated between 1993-1997 and 45% 1998-2002. There were 59 or 60 patients treated by silo closure. 10% were treated in the early time period and 90% in the later time period.

Outcome	Primary closure group	Staged silo closure	p-value
Length of stay	29.7 +/- 18	37.7 +/- 12	0.049
Ventilator days	2.5 +/- 3.6	8.6 +/- 4.8	0.008
Days to full feeds	31 +/- 23	32 +/- 17	0.88
Unplanned re-operation	17 (29%)	10 (17%)	0.0001
NEC	8 (13%)	5 (8.3%)	0.002
Stricture	14 (24.2%)	10 (17%)	0.038
Positive cultures	18 (31%)	12 (20%)	0.0001
Deaths	2 (3.4%)	3 (3.3%)	0.89

Table 2: This table looks at the two different time periods and examines reasons for re-operations. In table 1, the number of re-operations for the different method of treatment was given. This table now examines why these procedures were necessary. However, the numbers do not completely agree and there is no explanation given in the text.

Reason for OR	1993-1997 (overall #s 32 P, 6 S)	1998-2002 (overall #s 27 P, 53 S)
Decompression lap	6 P, 0 S	0 P, 0 S
NEC	7 P, 2 S	0 P, 4 S
Stricture	12 P, 3 S	2 P, 7 S
Reinsertion line	5 P, 3 S	0 P, 3 S
TOTALS:	30 P, 8 S	2 P, 14 S

To make sense of this table, the total counts and the overall numbers of patients treated by each method during that time period were added. Otherwise, the data can get very confusing here as there is a mix of treatment method and time period while considering these outcomes. Based on the numbers in this chart, it appears that every child in the initial time period had some sort of re-operation, though it may be that one child had several procedures and some had none. Either way, it is crucial to note the much higher rate overall of re-operation for all reasons in the earlier group, regardless of treatment method.

Discussion: One of the major difficulties with this study is the confusing presentation of the data which makes it hard to draw conclusions. Another problem is that many of the outcomes are subjective decision points and the investigators making management decisions were not blind to the treatments or the outcomes they were determining. Finally, again we face the

problem of historical comparisons as practice changes may have occurred during the ten year time period of the study. Given these issues, it is difficult to draw any valid conclusions from this study.