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WHICH OBSTETRIC PARAMETER DOES INFLUENCE LEVATOR MORPHOLOGY? A PROSPECTIVE OBSERVATIONAL STUDY WITH 3D ULTRASOUND

Hypothesis / aims of study
to evaluate the effects of obstetrical and fetal parameters on the dimensions and integrity of levator ani muscle (LAM) assessed by 3D ultrasound soon after vaginal delivery.

Study design, materials and methods:
patients delivered vaginally at our department between January-June 2009 and were included in our prospective observational study. 3D perineal ultrasound was performed between 48-72 hours postpartum, after voiding, in supine position and at rest. Axial plane obtained at the level of minimal levator hiatal dimension was utilized to determine hiatal circumference (between internal border of LAM and the inferior margin of the pubic bone). Diagnosis of LAM avulsion was defined when a defect occurred in at least 3 consecutive tomographic slices above the plane of minimal hiatal dimension (1,2). We correlated maternal, obstetrical and fetal factors (maternal and gestational age, fetal weight and head circumference, episiotomy, perineal tears, length of 2nd stage of labour, epidural, pudendus block, head position) with hiatus circumference and with the occurrence of LAM defects.

Results:
during study period111 women after vaginal delivery (99 spontaneous deliveries, 11 vacuum, 1 forceps) were enrolled in our study.

Variable: Hiatus Circumference

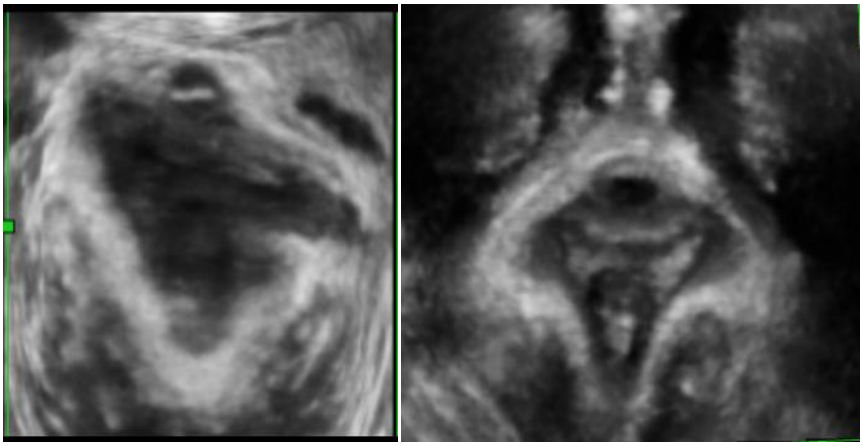
	Coefficient				95%-IC	
	B	Std.error	T	P value	Minimum	Maximum
	19,182	6,482	2,959	,004	6,316	32,047
Age (years)	,036	,033	1,086	,280	-,030	,101
Gestational age (days)	-,027	,017	-1,574	,119	-,061	,007
Fetal_weight (g)	,001	,001	2,017	,046	,000	,002
Fetal_head_circumf (cm)	-,059	,175	-,338	,736	-,408	,289
Episiotomy	-,325	,379	-,856	,394	-1,078	,428
Perineal tears	,090	,232	,387	,699	-,371	,551
2nd stage of labour (h)	,000	,004	-,045	,964	-,008	,008
Epidural	,013	,436	,030	,976	-,853	,879
Pudendus block	1,329	,501	2,653	,009	,335	2,323
Head_position(ant/post)	1,294	1,261	1,026	,307	-1,209	3,796

Variable: LAM defect

	Regress Coeff B	Std error	P value	Exp(B)
Age (years)	-,065	,045	,148	,937
Gestational age (days)	,005	,023	,820	1,005
Fetal_weight	-,001	,001	,140	,999
Fetal_head_circumf	,686	,257	,008	1,986
Episiotomy	-,622	,561	,267	,537
2nd stage labour	,009	,006	,102	1,009
Epidural	,356	,582	,540	1,428

Pudendus_block	-,037	,651	,954	,963
Head_position	-21,614	25197,862	,999	,000
Perineal tear			,775	
I grade	-,650	,618	,293	,522
II grade	-,945	,816	,247	,388
III grade	22,200	40192,969	1,000	4379886478,525
IV grade	19,797	40192,969	1,000	396148781,083
Constant	1,795	25197,863	1,000	6,020

Interpretation of results:
In multivariate analysis fetal weight (p=0.046) and pudendal block procedure (p=0.009) were found to be independent risk factors for enlargement of hiatus circumference. Fetal head circumference significantly influences the occurrence of LAM defect, so that the risk of having a LAM defect increases by 98% for each centimeter of circumference (OR=1.986).



LAM monolateral defect LAM bilateral defect

Concluding message:
Our findings suggest that fetal weight and pudendus block procedure contribute significantly to increase dimensions of levator hiatus; moreover fetal head circumference seems to play an important role in development of LAM defects.

References

1. 1. Dietz H.P. Biometry of the pubovisceral muscle and levator hiatus by three-dimensional pelvic floor ultrasound . Ultrasound Obstet Gynecol,2005;25:580-585
2. 2. Dietz H.P., K.L. Shek. Tomographic ultrasound imaging of the pelvic floor: which levels matter most? Ultraosund Obstetr Gynecol 2009; 33:698-703

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Is this a clinical trial?	**Yes**
Is this study registered in a public clinical trials registry?	**No**
Is this a Randomised Controlled Trial (RCT)?	**No**
What were the subjects in the study?	**HUMAN**
Was this study approved by an ethics committee?	**Yes**
Specify Name of Ethics Committee	**Institutional Review Board**
Was the Declaration of Helsinki followed?	**Yes**
Was informed consent obtained from the patients?	**Yes**