**METHODS** This study was a prospective observational study. Ethical approval was obtained and all women gave written consent. 264 primiparous women were recruited from the antenatal clinic at their booking appointment, all women were less than 20 weeks pregnant at the time of their first visit. Patients were interviewed, using a standard questionnaire, at booking, 28 weeks, 34-36 weeks of pregnancy and at 6 and 12 weeks postpartum. At the initial interview patients were asked about incontinence prior to pregnancy. The patients completed a frequency – volume voiding chart prior to each visit, except the first, and at each interview they performed a standing stress test. Details about the delivery were collected at the first postpartum interview. The frequency of declaration of incontinence at the visits were summed and these results used to compare those with and without incontinence postpartum ,using caparison of medians by the Mann Whitney U Test.

**RESULTS** To date 176 women have completed the study and are reported. Mean maternal age at delivery was 29.4 (SD = 4.60). The incidence of incontinence, both stress and urge increased in pregnancy with the greatest incidence at the 28 week visit. The incidence of incontinence declined after delivery. 16.4% of women gave a positive answer to the question 'is there any urine loss with coughing or sneezing' at the booking visit, 31.7% at 28 weeks, 30.1% at the 34-36 week visit, 10.9% at the first postpartum visit and 8.8% at the second postpartum visit. 9 (5.1%) women had stress incontinence at both of the postpartum visits, all these women were incontinent at the 28 week visit. Only two women (1% of whole sample; 10% and 15% of incontinent) at each postpartum visit described incontinence dating from delivery. Postpartum incontinence, at six and twelve weeks, was strongly associated with more numerous prepartum declarations of incontinence ($W=11 \times 10^3$, $p<0.001$; $W=12 \times 10^3$, $p<0.001$). The very low incidence of delivery-associated new incontinence precluded a meaningful vaginal/caesarean comparison.

**CONCLUSION** The incidence of incontinence during pregnancy is much greater than in the first 12 weeks postpartum and incontinence dating solely from delivery is very unusual. This suggests that it is pregnancy rather than delivery which plays the important role in the development of stress incontinence. It may be that pregnancy causes tissue damage or reveals an underlying tendency to stress incontinence which in most women resolves after delivery but which may then lead to incontinence in later life.

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# 40

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## ASSESSMENT OF PUDENDAL NERVE FUNCTION IN POSTPARTUM FECAL INCONTINENCE

**Aims of study:** Fecal incontinence following childbirth arises secondary to direct disruption of the anal sphincter muscles and /or traction of the pudendal nerves. Identification of neurological injury is critical for the selection of appropriate therapeutic protocols. The aim of this study was therefore to determine the role of detailed electrodiagnostic assessment of pudendal nerve function by comparing needle EMG and combined distal nerve conduction latency assessment to conventional proximal nerve conduction velocity assessment alone in women with postpartum fecal incontinence following obstetric injury.

**Methods:** A consecutive cohort of 33 women with a history of impaired fecal continence following primary repair of recognised obstetric anal sphincter disruption, were recruited twelve weeks postpartum. All patients were assessed by continence questionnaire, trans-anal ultrasound and electrodiagnostic assessment of pudendal nerve function. Electrodiagnostic assessment was performed using two techniques, 1) Proximal nerve conduction velocity assessment ( NCV ) using the St. Mark's technique to determine the pudendal nerve terminal motor latency ( PNTML ) and 2) combined needle EMG and peripheral NCV assessment using the Pudendo-anal reflex .

The PNTML was determined using a St. Mark's electrode. A stimulus of 50 volts for 0.1 msecs was delivered at one pulse per second, and the shortest reproducible latency recorded on an EMG machine. A PNTML of greater than 2.4 m/s was considered prolonged . Needle EMG and distal nerve conduction latency assessment was performed using a laptop EMG system. Electrodes were attached to the perineal area and a conventional concentric needle inserted into the external anal sphincter ( EAS ). Needle localisation was achieved by analysis of the auditory and visual appearance of the motor unit action potentials (MUAPs) observed on the oscilloscope and EMG speaker. Insertional activity was observed by asking the patient to ' bear down' as if to inhibit defecation.

Abnormal insertional activity was identified as a reduction in insertional electrical activity or the presence of positive sharp waves or fibrillation potentials. Recruitment was assessed by asking the patient to voluntarily contract the EAS. The

morphology of the emissions together with the duration amplitude and presence or absence of polyphasic potentials was recorded. Nerve conduction latency was next assessed using the pudendo-anal reflex . The concentric EMG needle was left in situ and the reflex was assessed using an electrical stimulator held by the patient. The cathode was placed directly over the clitoris with the anode lying free proximally. The current intensity used was below the individual tolerance threshold ( 20-30mv) using a pulse duration of 0.2m/s , sweep speed of 10 ms/cm, amplifier gain set at 200uv/cm and standard sensory filter settings.

Electrical stimulation resulted in three responses referred to as early, intermediate and late ( L1, 2 and 3). The response ( L3 ) was used to assess the integrity of the pudendo-anal sphincter reflex . An abnormal L3 value was taken as greater than 42 m/s. The duration and amplitude of the reflex was also assessed. Electrodiagnostic assessment of pudendal nerve function using both techniques was performed for both right and left pudendal nerves. All data recorded was stored on an IBM compatible database and statistical analysis performed using a statistical software package.

**Results:** The mean age for the study group was 31 years (range 22 - 41) and the median follow-up time was 18 weeks ( range 12 - 16 weeks ).The median fecal incontinence score was 15.5 ( range 8 - 20). All patient's had muscle disruption at trans-anal endosonography. Combined needle EMG and distal nerve conduction studies identified significantly greater neurological injury 27 ( 81%) compared to proximal nerve conduction latency testing alone 9 ( 27%); ( $p<0.0001$) .

9(27%) women had evidence of prolonged conduction nerve latency using the St. Mark's technique, which was confirmed by needle EMG. The mean PNTML was 2.1 m/s on each side ( right, range 1.8- 2.6m/s, left, 1.7 - 2.6 m/s ). 14 (42%) women had a prolonged pudendo-anal reflex latency ( L3 > 42m/s) with prolonged amplitude and duration.

At needle EMG 27 ( 81%) of patients had evidence of nerve injury, 17 ( 51%) reduced insertional activity and 27 (81%) positive sharp wave activity or fibrillation potentials. 16 (48%) demonstrated abnormal recruitment and 13 (39%) had evidence of polyphasic potentials with increased MUAP amplitude and potential reflecting ongoing recovery through collateral nerve sprouting.

**Conclusions:** These results show that needle EMG and combined pudendo-anal reflex conduction latency assessment identifies neurological abnormality in a greater number of women with postpartum obstetric fecal incontinence and may be a better selector for treatment than more proximal nerve conduction latency testing alone. We conclude that needle EMG with combined NCV should form part of the routine assessment of patients presenting with fecal incontinence following obstetric trauma.

# 41

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## ANATOMICAL AND FUNCTIONAL RESULTS AFTER REPAIR OF THIRD DEGREE ANAL SPHINCTER RUPTURE

Aims of Study

Many studies have been published about the problem of sphincter rupture during delivery. The publication of Sultan (1) about postpartum (pp) clinical occult, not visible but sonographically proven sphincter lesions has added a new dimension to this topic. No long term reports of morphological and functional results after immediate sphincter repair have been presented. The perineal and endoanal sonography are new modalities in morphological evaluation of the anal continence control system.
The objective of this prospective study was the evaluation of anatomical and functional results after primary repair of third degree anal sphincter rupture pp.

Methods

49 women (mean age 30.4±4.4 years) with third degree sphincter rupture and immediate postpartum repair were assessed 6 days, 6 weeks and 6 months pp.
History, clinical investigation and ultrasound were done in all follow up times. The perineal ultrasound scans were performed by a 5-MHz convex transducer. Endosonography of the sphincters requires a high-frequency transducer (10 MHz) for detailed resolution, near-field focusing and an axial 360° image to view the circular sphincter structures. Views of the canal at high, mid and low levels were taken. Of the women from the study group, 73.5% (n=36) had a spontaneous vaginal delivery, 24.5% (n=12) had a delivery by vacuum, and 2% (n=1) by forceps. The control group contained 55 (53.4%) spontaneous vaginal deliveries, three (2.9%) vacuum extractions, three (2.9%) forceps deliveries and 16 (15%) cesarean sections.