combined VVF and rectovaginal fistula (RVF). The majority 48(82%) of these were located in the upper vagina. None of the patients had an isolated RVF.

The mean fistula diameter was 2.5 (0.5-7cm). All 59 women underwent vaginal fistula repair under regional anaesthesia. In 56(95%) a Martius graft was performed in addition to delayed primary fistula closure and the remaining 3(5%) women had an appositional repair alone. All of the latter group had a VVF < 0.5cm in diameter. The mean follow-up time for this study was 33 months (range 1-440). Of the 59 women who had undergone fistula repair, 34(58%) complained of persistent urinary incontinence and 23(39%) had altered faecal continence at postoperative follow-up. Of these 15(25%) had mixed urinary and faecal incontinence symptoms. The mean faecal score was 7 (range 2-16). 34 women with persistent postoperative urinary incontinence underwent urodynamic assessment (UDS)(Table 1). Of these 17(50%) had stress urinary incontinence (GSI), 2(6%) detrusor instability and 15(44%) mixed incontinence. In addition 32(94%) had bladder hypersensitivity and 5(15%) voiding difficulty. 29 (85%) of these were noted to have a fixed bladder neck at urodynamic assessment.

Table 1: UDS (n=34)	GSI n=17	Mixed n=17
Voiding cystometry		
First desire	110(0-300)	76(40-200)
Strong desire	145(0-300)	114(50-270)
Capacity	222(125-300)	193(100-300)
Pressure rise on filling	6.6(2-12)	40(13-80)
Uroflowmetry	n =12	n =3
Flow rate	11(3-29)	18(6-20)
Residual	18(0-80)	65(0-200)

Conclusion: This study demonstrates the high anatomical success rates which can be achieved in specialised fistula units. The functional outcome remains poor however, with high rates of persistent faecal and urinary incontinence following fistula surgery. While urodynamic assessment has identified a significant number of women with persistent stress urinary incontinence who require further continence surgery, the mechanism of faecal incontinence in this group remains poorly understood and limited treatment is currently available. Further research is required to evaluate the underlying mechanisms leading to persistent faecal incontinence in these women in order to develop appropriate treatment strategies to address this tragic problem.

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VOLUNTARY ABDOMINAL EXERCISE AND PELVIC FLOOR MUSCLE ACTIVITY.

Aim of study In cases of urinary incontinence it is generally advised that pelvic floor (PF) muscle exercise be carried out without abdominal or hip muscle activity. Yet it is known that abdominal muscle activity normally accompanies a PF muscle contraction (1) and preliminary evidence exists that PF muscle activity occurs in response to specific abdominal exercises (2). This study aimed to confirm those preliminary findings.

Methods Seven healthy volunteers, one male and six female (five with normal vaginal deliveries and one nulliparous female), were studied to measure changes in vaginal and anal pressure and electromyographic activity (EMG) during a series of abdominal manoeuvres. Recordings were made with subjects in supine lying using vaginal and anal pressure probes (Incare, Hollister, USA), followed by EMG recordings with a vaginal probe (Periform, Neen, UK) and anal adhesive surface electrodes (Medtronic , Denmark). In the male subject anal pressure and EMG were measured simultaneously. Abdominal activity was monitored by a pair of surface electrodes placed on the lateral abdominal wall, and by ultrasound recording of abdominal muscle changes. Recordings of gastric pressure with the transducer inserted via the nose, were made in one female and the male subject. Hip adductor and gluteal muscle activity were also monitored in these two subjects, using pairs of surface electrodes. Subjects performed two repetitions of 1) maximal PF contraction 2) gentle abdominal isometric muscle contraction 3) moderate abdominal isometric contraction 4) strong abdominal isometric contraction. Further EMG recordings were made in standing. These were1) maximal PF contraction 2) abdominal wall relaxation and gentle contraction in an upright position 3) abdominal wall relaxation and gentle contraction in a forward lean position. EMG data was expressed as an increase in amplitude from baseline as a percentage of that recorded during a maximal voluntary PF contraction. EMG and pressure data were compared between conditions using a repeated measures one-way analysis of variance (ANOVA) and Duncan's multiple range test.

Results EMG of the PF muscles, recorded from both anal and vaginal electrodes, increased above resting level with all of the abdominal contractions. Analysis of the hip adductor and gluteal muscle EMG indicated that the PF EMG was not affected by cross-talk from these muscles. The increase in PF EMG with a strong abdominal contraction was significantly greater than with the gentle and moderate contractions. The EMG recorded with the vaginal electrode during the strong abdominal contraction was no different from that recorded during a maximal PF muscle contraction. Vaginal and anal pressures increased in a similar manner to the EMG changes. Gastric pressure increases commenced after the onset of anal and vaginal pressures. Both in upright and forward lean standing positions vaginal EMG showed a decrease in activity from baseline when the abdomen was relaxed and an increase with a gentle abdominal hold.

Conclusions The specific abdominal exercises used in this study result in PF muscle activity in healthy subjects. The onset of PF EMG prior to the onset of gastric pressure indicates that the response of these muscles must be preprogrammed by the central nervous system to contribute to intra-abdominal pressure and maintain continence. The results indicate that abdominal exercises such as these could be used to maintain PF muscle support, but further research is required to confirm the successful application of such exercises for rehabilitation in symptomatic subjects.

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PARAURETHRAL CONNECTIVE TISSUE STATUS OF POSTMENOPAUSAL WOMEN WITH GENITAL PROLAPSE WITH AND WITHOUT GENUINE STRESS INCONTINENCE

An effective closure of the female urethra in stress situations is dependent on an integrated action of various anatomical intra- and extraurethral structures. The most important extraurethral structures - from a functional aspect - are the suburethral vaginal wall, the pubourethral ligaments, the pubococcygeus muscles and the paraurethral connective tissue. An important ingredient in the supportive structures of the genitourinary region is fibrous connective tissue, consisting mainly of collagen and structural glycoproteins. Hence, defects in the actual connective tissue – in particular the paraurethral connective tissue that connects the aforementioned structures to each other and to the urethra – will bring about an ineffective urethral closure. Female genuine stress incontinence (GSI) may be caused by defective connective tissue per se and / or by a disconnection to extraurethral structures, whereby the urethra cannot be closed at stress situations. Genital prolapse may or may not be associated with GSI, or may even