

## Postpartum support of the pelvic floor connective tissue

A previously neglected therapeutic approach

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■ **The causes of postpartum pelvic floor dysfunction are multifactorial neurogenic, muscular, or relate to connective tissue. Muscular defects can be treated by pelvic floor muscle training including biofeedback of the pelvic floor muscles, and neurogenic defects can be treated by electrostimulation. Whereas defects in the connective tissue support system are currently only treated in cases of pronounced uterovaginal prolapse with clinical symptoms by pessary therapy as a passive support function. So far, no preventive or supportive treatment of the connective tissue has been established. Different therapeutic approaches are presented in this article which are available for this indication.**

### Pessary therapy

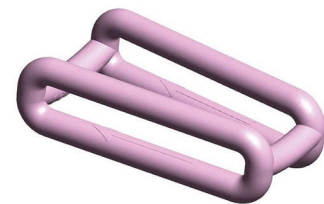
Pessary therapy is an established treatment for uterovaginal prolapse. The foreign body sensation and voiding dysfunction of the bladder and bowel

can be positively influenced by pessary repositioning. If support pessaries can unmask occult urinary incontinence, suburethrally placed pessaries (urethrapessary with pad, foam tampons, etc.) treat urethral continence. Support pessaries have predominantly a passive holding function, being placed either on the musculus levator system (sieve trays, rings) or held in place by their volume and concave wall texture (cubes) (1, 2, 3).

In the postpartum situation, this may eventually lead to additional strain on the levator ani muscle, which is also overstretched by delivery and whose convalescence is thus affected. So far, only the Keulen (Gellhorn) pessary has been reported to provide retrosymphiseal support and thus be passively retained. In Germany it is less established and the retrosymphiseal support function is not always feasible in clinical practice.

From an anatomical point of view, postpartum pessary therapy should reduce any prolapse, which can be easily achieved with sieve cup or cube pessaries. Repositioning of the uterus

in the anteflexive position and relief of the sacrouterine ligaments as well as reconnection and relief of the lateral fixation of the vagina as an important anatomical component of the continence control system can in turn be achieved specifically by the shape of the Restifem (restitutio feminina) pessary (see illustration). The pessary's longitudinal stirrups stabilize the lateral vaginal arches. The pessary is passively supported by the pubic bone and thus relieves the levator ani muscle. The posterior transverse bar lies in the posterior vaginal vault and supports the uterus, the narrower anterior transverse bar stabilizes the anterior vaginal wall suburethrally and supports the continence control system.



**Fig. 1** Restifem pessary: The narrow transverse bar is positioned suburethrally, the wide transverse bar in the posterior vaginal vault. Arrows mark the direction of insertion. The longitudinal stirrups fill the vaginal sulcus.

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Restifem is self-inserted by users in the morning and removed in the evening. After the puerperal period (when no lochia occurs anymore), the three- to six-month therapy begins, which should be offered therapeutically and preventively.

### Local oestrogen therapy

It has long been known that oestrogen receptors are present in the pelvic floor muscles, but they have also been shown to be present in the connective tissue in the pelvic floor region, i.e., the sacrouterine ligaments (4, 5).

Oestrogen receptors regulate collagen metabolism by affecting fibroblasts, i.e., oestradiol application leads to an increase in mRNA for collagen I and III in fibroblasts of connective tissue structures of the vaginal wall and in connective tissue within striated muscle (6). This explains why application of oestrogen locally can improve the elasticity of the lamina propria vaginae and the contractility of the tunica muscularis vaginae.

In addition to fibroblast activation, the positive effect of oestrogens on wound healing is achieved primarily by influencing metalloproteinases. Both the inflammation and proliferation phases and remodelling are favoured, leading overall to faster epithelialization (7). Donders et al. (8) showed in postmenopausal women that with vaginal local application of estriol an increased serum level is detectable only for a short time. There are no such studies for breastfeeding women. Due to the similar nature of the vaginal skin during „breastfeeding atrophy“, it can be assumed that local therapy is similarly safe and can at least be used or combined with pessary therapy in the case of corresponding symptoms.

### Neural therapy

Injection with local anaesthetics helps to improve wound healing and relieve pain, even in the long term. The positive effects on wound healing are explained by the anti-inflammatory effect of local anaesthetics. The mod-

ulation of the inflammatory response is explained by the interaction of signal transduction G-protein coupled receptors, by the binding of ceramide (causing cell necrosis) by p-aminobenzoic acid, and by the binding of long-chain unsaturated fatty acids as mediators in inflammatory processes by diethylaminoethanol (9, 10). This also leads to reduced scarring, especially in secondary wound healing.

Pain treatment by neural therapy is achieved via mechanotransduction, whereby cellular responses are formed via biochemical signals, and via matrix deformation, which leads to long-term modulation of sensory information via modification of the extracellular matrix (11).

In lactating women, procaine is particularly suitable because it is hydrolysed as an ester complex in the tissue and thus does not pass into breast milk.

### Vitamin D substitution

The effect of vitamin D (which acts as a hormone by catalysing more than one enzymatic reaction) is anti-inflammatory and immunomodulatory. In the skin, where vitamin D is produced, activation of T-cells has been demonstrated. However, the same effects have also been shown in connective tissue in other locations in rheumatism research (12, 13).

A correlation between the level of vitamin D and pelvic floor muscle strength has been shown postpartum, such that pelvic floor dysfunction is more frequent with vitamin D deficiency (17). This can also be assumed for the pelvic floor connective tissue. Therefore, vitamin D substitution is useful in the case of symptoms, but also preventively for the purpose of convalescence of the pelvic floor connective tissue, in addition to the other beneficial effects of vitamin D.

Systemic vitamin D substitution in breastfeeding women must take the transmission to the child into account. The mother's substitution should be

done cautiously and that of the child should be paused under certain circumstances (14).

### Laser therapy

Similar to oestrogens, laser treatment leads clinically, histologically and molecularly to an activation of fibroblasts by upregulation of matrix metalloproteinases. This results in increased production of the extracellular matrix with stably structured collagen fibrils. This is a reversible effect, i.e., it can also wear off. Good levels of success have been shown in atrophy of the vaginal epithelium in postmenopausal women (15), which is possibly transferable to breastfeeding women. Similarly, success has been reported in the treatment of stress urinary incontinence (16). Laser therapy, with its local effects, is highly applicable to breastfeeding women. The July 2018 FDA (U.S. Food and Drug Administration) warning describes insufficient study data on vaginal „rejuvenation,“ and women should be educated about this.

### Fascia treatment

Treating the connective tissue, such as fascia treatment as a subspecialisation of physiotherapists, belongs to the physiotherapeutic spectrum along with the pelvic floor muscle training including biofeedback-therapy. This specific therapy is mainly used to combat pain postpartum and is very effective.

### Conclusion

The postpartum support of the pelvic floor connective tissue is indeed a hitherto neglected therapeutic approach; there is therefore an urgent need for action. All previous measures of involution are aimed at the convalescence of the musculature or the neuromuscular system. The aspects listed here have long been proven in their effectiveness, just not in the postpartum situation, for which corresponding studies are pending. Of course, no false expectations should be raised for future studies. The therapeutic effect of pessary therapy and local oestrogenisation in urinary incontinence and descensus will certainly be easy to demonstrate.

However, the preventive effect will be more difficult to discern, which is probably due to the multifactorial genesis of urinary incontinence and descensus.

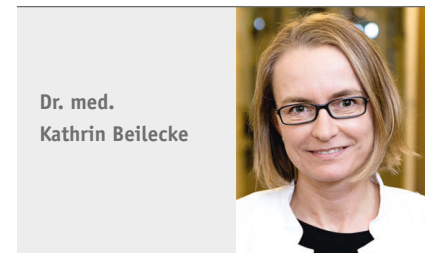
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## Conflicts of interest

The author declares no conflicts of interest.

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