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Minimal Traumatic Skin Traction in Huge Myelomeningocele Repair Vs Conventional Rotation Flap "The Magnitude of Surgical Trauma Considerations in Newborns"

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Abstract

Neurosurgeons often face cases of myelomeningocele of different sizes. Some of them are so big that their defects involve most of lumbosacral region. Conventional rotation flaps in huge defects, may dose not succeed in closing the gap, if do! it needs so aggressive wounding and undermining, which is considered a big surgical trauma to the new born. Some use skin traction with K-wires or release incisions, which are also traumatic to the delicate pediatric skin. Alternatively, I recommend a programmed and technical skin traction with non-allergic adhesive bands in certain wide points of the Para-lesional skin with artful defect protection from infection for the period of skin traction, is a new, new-born friendly procedure of big defects closure. The relative functional restoration in this case indicates that this technique is not only less traumatic but also finds the way to some wandering lumbosacral nerves to their targets. Which brings to the concept of "Biological Surgery".

Keywords: *Huge Myelomeningocele Repair; Programmed Skin Traction; New-Born Friendly Techniques; New Procedures; Pediatric Neurosurgery; Neural Regeneration in Myelomeningocele; Biological Surgery*

Introduction

Neurosurgeons often face cases of myelomeningocele of different sizes. Some of them are so big that their defects involve most of lumbosacral region (Figure 1 A and B). That necessitates a plastic surgeon contribution in order to close the skin defect which act as a second challenge after the first challenge, which is, the Dural defect closure. In some situations, neurosurgeon may lack the aid of plastic surgeon, so the neurosurgeon should take the act of skin closure by himself, by doing the conventional rotation flap [1]. In huge defects, this rotation flaps may dose not succeed in close the gap, if it do, it needs so aggressive wounding and undermining, which is considered a big surgical trauma to the new born. Other techniques use skin traction with K-wires or release incisions [1,2], which are also traumatic to the delicate pediatric skin. Non-cellular cadaveric dura with fibrin glue are used but still skin is the problem. In spite of data with no long-term effects, are available [3,4]. It is nice to treat intra - uterine MM, but still big ones are a challenge and not done everywhere [5]. Alternatively, I recommend a programmed and technical skin traction with non-allergic adhesive bands in certain wide points of the Para-lesional skin with artful defect protection from infection for the period of skin traction, is a new, new-born friendly procedure of big defect closure (Figure 2).

Aim

To show that repair of such huge MM is not one way, as rotation flap or other aggressive techniques. Also to introduce to the concept of biological surgery.

Method and Technique

In (Figure 1 A the one on the left where the following steps are performed on. 1 B the one on right is shown just for showing huge MM variety) we see the big defect of a new born boy in his first week of age. Delivered through caesarian section. Repair was delayed may be

due to a technical difficulty. He was brought by his parents to my private clinic. After examination, a complete paralysis of lower limbs and anal sphincter which are the usual findings in much smaller defects. I put a plan in my mind, just wait for parents agreement. After a brief discussion with the family to orient them about what can be done in such cases (introduction), advantages and disadvantages of every method including my plan or technique, the parents choosed my one.

Figure 1A and 1B

In Figure 2, an illustration shows how this technique works!

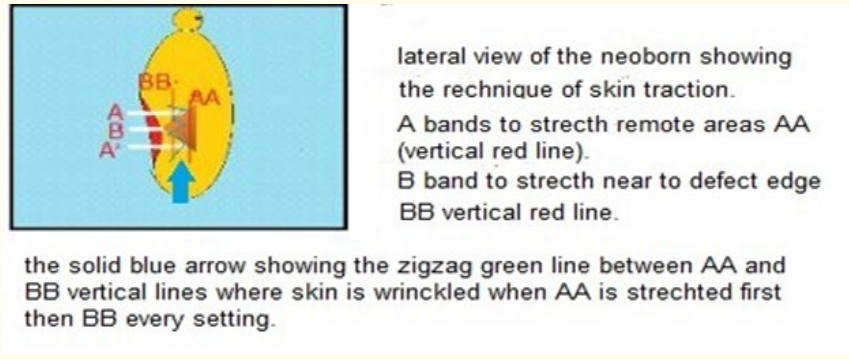

Figure 2

The principle is to gently and gradually stretch the skin around the defect in a wide zone in a double level manner, remote and adjacent levels. The remote level, is by putting a three parallel non-allergic adhesive bands of 2.5 - 3.0 cm wide for each to the infant flanks bilaterally and are pulled gently towards the midline crossing the gap. The lateral ends or tips of these bands are sticky in first 3.0 - 3.5 cm only, where the rest adhesive property of the band is canceled by any mean like putting a layer of gauze between the band and the skin, or simply can use instead a strip of gauze and the end is adhesived to the skin with a small piece of adhesive. The idea behind this, is to stretch skin in points away from the lesion periphery to provide two zones, the first zone in which the whole skin surface area around the body across section is stretched by the three parallel bands to provide us the maximum percentage of circumferential skin contribution in this stretching to make a second wrinkled zone (Figure 3) lies between the bands end points and the lesion edge. This wrinkled zone act as a material to the adjacent level which is around the defect opening where this wrinkled zone can be in its turn stretched over the gap defect

with fine non-absorbable sutures anchored in the body of fibrous tissue in the junction between the skin and fascia. These stitches are drawn towards the center of the gap in a manner makes the more in number lateral stitches are the more tight than cephalic and caudal stitches in order to render the final sutured incision vertical not horizontal as in this case (Figure 4,5).

Figure 3

Figure 4

Figure 5

However, making it horizontal goes more with skin creases. But vertical is more anatomic embryologically.

Practical point 1: In order to bring more rich skin to the wide mid of the defect gap, it is better to anchor the tip of the middle traction band more lateral to the upper and the lower bands.

Practical point 2: non absorb-able sutures used to attract the edges of gap of defect are connected to some a rubbery structure to bring spring effect on stretch, like cutting a Foley's catheter tube into rings and each bi-directional sutures are joined to this rubber ring.

Results

Result is shown with the picture of Figure 6.

Six months later the baby became capable of abduct his hip unilaterally where it was non, unfortunately I lost the video for that movement. Also at this stage I lost contact with the family as follow up for unknown reason.

Figure 6: *Shows an acceptable esthetic wound and suture in face of the initial huge MM.*

Discussion

A way from statistical and demographic aspects of myelomeningoceles MM occurrence and repair. Also from article classification as this being a case report or others. Here we need to discuss more vital issues taking this sample to build a commentary or a philosophy that direct and govern the principles with which we make a propagated and better vision to a problem and solution. The more vital issues; A- It is the poor new-born or infant side, whom on, the surgeons will exert either their muscles power or surgical arts. As the new-born is so delicate creature, surgeons have to be Busy-minded to how to direct the power of art, rather than the power of muscles, towards helping this humanity new-coming member with a special need by helping this baby with least surgical trauma to re-guvinate his/her loss or defect. B- still more vitally and virtually to encourage the un-descended nerves to find their way home!! Ok, today it is impossible, but it should not be so, tomorrow. Surgeon role is not limited to cover defects successfully and gently. Surgeon role is bigger, should consider coverage of the defect is not the target. The target is, to help nerves fibers tips finding their effectors. How??!! Yes, by his/her fingers of mind not that of hands. How? by reversing the defect natural history mal-steps as; C- The dura and skin repair issue. It is of great failure if we think in skin successful closure only by any mean or technique and neglect dura competent or water proof closure. Where the cerebrospinal fluid CSF leak or collection in a subcutaneous sac is of great discomfort and sense of un-satisfaction to the neurosurgeon. Today standards, adopt skin rotation flap and dura patching. If we accept the rotation flap as a natural, Dural patching is not natural by any mean according to the above principle (opposing the mal-steps in neural tube closure) or more frank to correct the pathogenesis after it had been established its errors. We do not know what made the signal for this defect to begin, what level to start and to involve what. Rather we have idea about what occurred. We may imagine as a matter of reverse engineering about what went wrong step by step. We do not know what diverged the neural tube edges. So, let us simply, converge them!! This gentle programmed converging action we are mimic the

nature which was hindered by some mean in certain level like the zipper when something stops its marsh in certain level. Even, in zipper example approximation of the two sides by fingers facilitates zipper slippage to its end inspite of some structural impairments. Traction of the skin which in its turn transmits the traction to dura to approximate the home (midline). The traction is a simple mechanical stimulus or signal. As this signal is below the level of destruction it act as a chemotactic to attract cells of remodeling and substitution (stem cells). Also, this sustained gentle traction will slide and glide collagen fibers in the layers in question to widen in area.

Here we arose multi system by this simple traction act. As if we called for hindered notochord to regain or re-start its fusion. So, these steps collectively will resume nerves paths to their targets as permit as. This is an example on the concept of "Biological Surgery'' where we utilized the corrective capacity of the body by simple signal with minimal surgery to achieve a huge achievement.

If a surgeon became happy by only satisfactory defect repair with rotation flap and Dura patch, and admire his/her achievement, he/she will not ask for more progress or more problem solving in depth. The wise man Alī ibn Abī Ṭālib (http://en.wikipedia.org/wiki/Ali_Ibn_Abi_Talib) said "Admiration Prevents from Further Increment".

Conclusion

Single or few cases of such huge MMC will form very minute percentage in the community as an incidence. If we look to the number without focusing in the depth or not read what in between the lines and NOT to take them as an opportunity to develop, we surely miss the knob of truth door or a knot in the rope of salvage.

Recommendation

I invite interested workers and researches and related surgeons to cooperate for the more of the better.

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