MINIMALLY INVASIVE METHOD OF FISTULECTOMY IN ACUTE PARAPROCTITIS TREATMENT OF INFANTS

Authors have examined the results of surgical treatment for 123 infant patients with Acute Paraproctitis (AP) being cured for the last 10 years. Was offered the less invasive, less traumatic, defensive way of fistulectomy at AP treatment in breast fed infants, reducing possible relapse up to minimum. The suggested approach provides full desquamation and removal of fistula channel epithelium lining rests, and therefore the rectum sphincter is not damaged and there is no much damage in mucus. Examining with scanning electron microscopy (SEM) of micro drainages used for micro sanitation in the form of nylon line with knots, has found that their use contributes to removal from the fistula cavity not only detritus, fibrin and desquamated cells, but pathogen content in the form of microorganisms such as sticks, and structures fungi. It was determined that it is necessary to use not only antibacterial and anti fungous therapy. The advantage of the new operational way over the traditional approach is prevention of wound reinfection.

Of the 52 breast patients, 51 obtained results of treatment were quite good in the near and distant periods of illness. Application of minimally invasive fistulocriptoectomy at AP infants maximizes the improvement of the results of surgical treatment, and allows to minimize complications.

Keywords: Paraproctitis in breast-feeding children, fistulectomy.

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Introduction

Frequency of acute paraproctitis (AP) in breast fed infants, among the total number of patients with purulent-inflammatory diseases, 1.9 times higher than in children older than 1 year and amounts 42.5% in children aged up to 3 months (Abaev, 2003; Fyodorov, 2002; Busmelov, 2004; Hamraev, 1997). After surgical treatment the relapses of acute paraproctitis (AP) make 19-27.7%, and its transformation into chronic form - 10-19% (Hamraev, 1997; Lenushkin, 1999; Rausburu and Sotham, 1998). According to other authors the total number of unfavorable outcomes (UO) is 25%, which, obviously, is connected with given treatment: at simple pararectal section of furuncle the frequency of AP is 16% of cases, and the chronization process is 12%; and, even at a very early section and drainage of purulent focus, relapses of diseases create 22% (Hamraev, 1997; Abaev, 2003). This suggests a direct dependence between radical operation and complications of AP. The younger the child the more is the number of relapses. Therefore, the high frequency of postoperative relapsing disease course and unfavorable results of AP treatment, demanding the second, sometimes quite long, treatment in breast fed children, have become an challenging issues in the children’s surgery.

Materials and methods

We have analyzed the results for the last 10 years of surgical treatment of 123 patients with AP of breast feds, being under treatment on the basis of hospital children’s surgery at Tashkent Pediatric Medical Institute. The age distribution of patients was the following: the newborns were 24 (19%), 2-6 months old were 81 (66%), 7-12 months old were 18
Frontal lateral localizations of AP were 110 (89%) cases and back localizations were 13 (11%). Subcutaneous form of AP was observed in these patients in 121 (98.4%) cases and submucous form was in 2 (1.6%). Other forms of AP in breast fed children had not been detected.

The patients had been organized in 2 groups: control (archive) group made 71 people and the main group made 52. General clinical, morphological observations and anoscopy were taken. General clinical examinations included anamnesis study, examination of somatic and local status of patients. Required to morphological study the light microscopic micrographs had been taken using the microscope “Biolam I” with digital camera “HP Photosmart R927”, involving the optical system of the microscope with a special adapter. For scanning electron microscopy (SEM) samples, after fixation, underwent dehydration in alcohol, acetone, then, were dried using the critical point in the apparatus HCP-2, deposited with gold in the apparatus IB-2 and investigated in the electron microscope Hitachi S 405 and (NTSH MZRU2).

Results and discussion

Retrospective analysis of treatment long-term results in 71 infants with AP in the control group showed that inadequate treatment made 45.9%, satisfactory - 30.6% and good – 20.5%. High percentage of AP unfavorable treatment results in the breast fed children were caused by the following factors:

a. late visiting of a doctor and groundlessness of occurred out-patient treatment;
b. inconsistent primary clinical diagnosis of AP, wrong choice of surgical treatment ways;
c. underestimation of natural somatic state of child’s organism and accompanying diseases.

In 71 patients of the control group surgeons performed not-radical operations at the early state of disease - sections with the aim of evacuation of furuncle without or with partial crypt removing. In dissected AP forms (12 patients, 13.5%) there was only local treatment of purulent wound. In 13 (13.5%) patients the furuncle’s dissection was performed with cryptectomy. Relapses of diseases were observed in 22% of examined children in the periods from 1 month to 8-9 years, in some patients after 2-5 times of furuncles dissection. The choice of operative method depended on localization of furuncle, internal hiatus of fistula and location of fistula channel in relation to the sphincter. During AP dissecting the scale of operative interference in all children envisaged compulsory dissection of Morgan crypt. Further there were provided antibiotic therapy, local treatment such as bandage with ointment, UHF course. Relapse was often observed and the acute process transformed into a chronic one in classic versions of AP during the postoperative period, in spite of the intensely conducted general and local treatment. This was conditioned by partial or full residues of epithelium lining in fistula which contributed to incomplete or bad healing of wounds of the wound channel. After passing some time, this unfavorable background caused a new inflammatory process and relapse of disease.

Majority of recommended surgical treatment options for AP in children assume the “opening of abscess with cryptectomy” and preventing relapses (Lenyushkin, 1999; Fedorov et al., 2002). The existing ways were traumatic in babies, were not always radical and effective. In this regard in the main group of 52 patients we carried out radically less invasive way of fistula cryptectomy AP in the newborns and infants. When applying this radical minimally invasive and gentle method, relapses decreased to a minimum.

The new suggested method proposes determining under intravenous anesthesia the fistulous channel using Anoscopy. Then the needle with special synthetic thread (monopril, vicril) or nylon line is taken through fistula channel in a place where the end of the needle touches the skin, stepping away from the anus. Further, we make the 3mm thick skin incision, exhaust the pus, then the needle with thread is taken out through the wound (Figure 1, a-b). With a syringe put on catheter the abscess cavity is washed with 3%
hydrogen peroxide, antiseptic solutions (or Miramistin furacilin and solutions of antibiotics) (Figure 1, b). Several knots are made on the thread and carried out 3-4 times through fistula channel along and against clock hand, by that less invasive method the epithelium lining of fistula channel and crypts are shelled out. This less invasive spare operation prevents wound infection, and left a string contributes to steadfast drainage and cleaning of wounds from the pus day and night. The thread, left in fistula channel for day and night, gives possibility, without taking out it from the wound, to form several knots according to the fistula channel size (Figure 1, d). Also this thread is a reliable guide for accurate, less-traumatic sanitation of fistula. After that, in a rectum the tube which has been wrapped up by bandage, soaked by vinilin ointment for isolation of a wound from feces is established. The thread is fixed on the skin, and the towel soaked in hypertonic solution is put on the wound. On the second day the purulent cavity is washed out with solution of hydrogen dioxide and miramitsin. Then the end of thread (knot) is taken in hands and through few accurate movements along and against the clock, through the fistula channel, the staging husking of epithelium lining in the fistula lumen is performed (Figure 1, d).

Simultaneously the surface of thread is cleaned. The sign of full removing of epithelium lining and crypt of fistula channel is appearing of bloody or ichors' discharge from the wound. This less invasive manipulation is repeated 1-2 times, then, the threads are removed.

In postoperative period all patients were prescribed antibiotics with local sanitation and antiseptics. The results of study showed that in the nearest postoperative period, the cleaning of wound from pus was 2-3 days earlier than in control group (2.84±0.49), granulation, i.e. beginning of wound epithelization was 2-5 days earlier (4.51±0.64) than in control group.
Complete removal of crypts and lining, and the role and function of micro drainage left in the wound to cleanse the thread (nylon line) had been demonstrated by light microscopy and SEM. Light microscopy showed that the fistulous channels were filled with detritus and fibrin with a high content of microorganisms in the form of fungi structures. In the fistulas lumens there were detected individual cells such as lymphocytes and significant accumulations of detritus, fibrin and compact homogenous mass. Among these masses there were found rather destroyed large cells, which were obviously desquamated epithelial cells. Quite often, the fistula channels were located among the layers of fatty tissue. Often the muscle fibers served as the wall of the fistulas with detrital masses in the lumen. Sometimes these fibers are necrotized and melted (Figure 2). Besides the detritus of individual cells, there were indicated fungus structures in masses filling the lumen of the fistula channel. These structures were threads, intertwined with each other and separated discrete particles of round-oval shape, which represent both mycelia and mycelium (Figure 3). As a rule, around the fistula channels young granulation tissue was formed with big number of micro vessels, a variety of cellular elements, mainly lymphocytes, fibroblasts and connective tissue fibers. A large number of micro vessels of various calibers, in the vicinity of fistulas channel, also indicated an active neovascularogenesis in these zones.

After sanitation SEM observation of nylon line showed that on its surface large number of different applications representing the fistula channel content appear (Figure 4). At little enlargement these applications represent homogenous formations. At high magnifications, it is clear that they constitute a discrete structure (Figure 5). Further SEM resolution increase clearly helps to distinguish detritus, fibrin and red blood cells. In addition to red blood cells and fibrin, one can distinguish not only the epithelial cells with spikes and irregular cytoplasm membrane, but also a variety of microorganisms, mainly in the form of sticks (Figure 6). SEM allows clearly see the contacts of microorganisms with epitheliocytes and also fungus elements (Figure 7). Alongside with microorganisms and epitheliocytes there are erythrocytes, mainly their pathologic forms: echinocytes and stomatocytes (Figure 8). When repeated sanitation on the surface drainage nylon line, microorganisms were virtually undetected and there were only red blood cells (Figure 9).

SEM observations of used for micro sanitation the micro drainage in the form of nylon line with knots, for the first time made it possible to show that their use contributes to removal from the cavity of fistula not only detritus, fibrin and desquamated cells, but pathogen content in the form of microorganisms, such as sticks, fungi structures. Morphologically, it is proved that this method completely extirpates the remnants of the lining in fistula channel, deletes in the crypt the epithelium portion prone to inflammation, and, does not create injury to rectum sphincter; a little defect in the mucosa is formed. After the removal of ligature, wound channel is uniformly filled with granulation tissue and a strong secondary scarring, which ensures rapid healing of perineal wound, and prevents the recurrence of disease.

**Figure 2. Necrotic muscle fibers of the walls of fistulas of the G-E 10x10.**

**Figure 3. Fungus structure in lumen of fistula channel G-E 10x10.**
Thus, the developed less invasive method of rehabilitation using nylon line, which provides a complete removal of contents and fistulas lining residues. This method differs from the traditional method: it is a radical, less-traumatic and minimally invasive way. In all 51 patients-infants, we have obtained good results of treatment in the near and long periods of the disease. As evidenced by our data, the frequency of relapses in multiple localization of AP occurred only once. The cause of recurrence of AP was the branching of the fistula in the complicated form of AP.
Conclusion

Minimally invasive fistulectomy represents reliable option in AP treatment in infants. Application of minimally invasive fistulectomy in AP infants provides significant improving of surgical treatment results and minimizes complications.

References