

MODERN CONCEPT OF RENDERING AID TO WOMEN WITH OVARIAN HEMORRHAGES

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Abstract

Aim: Analysis of modern medical care for women with ovarian hemorrhage, determination of the main diagnostic criteria that influence the choice of treatment tactics and further prognosis of the outcome of treatment of ovarian apoplexy.

Material and methods: The provision of medical care to 888 women with ovarian apoplexy. Depending on the volume of hemoperitoneum, all patients were divided into three groups.: Group I – 480 (54.0%) women in whom intra-abdominal bleeding did not exceed 200 ml; Group II – 283 (31.8%) patients with hemoperitoneum ranged from 200 to 500 ml; Group III – 125 (14.1%) patients with hemoperitoneum volume greater than 500 ml.

Results: According to the data of the transvaginal US, a linear dependence was observed between the level of free liquid and the volume of hemoperitoneum ($r=0.63$, $p<0.05$). In 792 (89.2%) patients the diagnosis of apoplexy of the ovary and intraperitoneal hemorrhage was made to surgical intervention- on the basis of clinical picture and US data. The most frequently performed hemostatic operation was resection of the ovary – 477 (77.2%) interventions. The average volume of hemoperitoneum discovered in patients with AO, in absence of the adhesive process was (273.5 ± 21.3) ml, whereas in patients with the expressed adhesive process of the small pelvis organs it was (141.4 ± 35.5) ml. The cause of AO was the corpus luteum or cyst of the corpus luteum in more than the half of the cases – 348 (56.3%).

Conclusions: The manifestation of the clinical symptoms in apoplexy of the ovaries depends on the volume of intraperitoneal hemorrhage. The application of laparoscopy as a main therapeutic and prophylactic method in AO allows to preserve, and sometimes to restore the reproductive function of a woman and to reduce the rate of the disease relapse development.

Key words

laparoscopy,
apoplexy,
hemoperitoneum,
treatment of ovarian hemorrhages

INTRODUCTION

The pathologic states, which require rendering emergency aid, take a special place in the structure of gynecological diseases. More than half of urgent gynecological operations are performed for acute gynecological pathology, complicated by intraperitoneal hemorrhage [1; 2]. Apoplexy of the ovary (AO) occupies the second place among the causes of intraperitoneal hemorrhages in the work of the gynecological hospital, giving place only to the disturbed ectopic pregnancy [3]. Videoendoscopic technologies have been “the gold standard” of diagnosis and treatment of the practically entire urgent gynecological pathology, including apoplexy of the ovary already for a period of several decades [2; 4; 5; 6]. In the individual clinical cases the sudden pathologic rupture of the ovarian tissue is not accompanied by extensional hemoperitoneum, and hemorrhage neither exceeds the limits of the ovarian capsule nor is accompanied by minimum intraabdominal hemorrhage. Patients with the localized intraovarian hemorrhage or insignificant intraperi-

toneal hemorrhage, which is controlled, in presence of the moderate pain syndrome, require conservative treatment [7; 8].

AIM

The aim of our study was the analysis of rendering aid to women with apoplexy of the ovary, determination of the basic clinical, laboratory and ultrasonic criteria, which influenced the choice of therapeutic tactics, evaluation of the immediate and long-term results of treatment of ovarian hemorrhages.

MATERIAL AND METHODS

To achieve this aim we have analyzed aid to 888 women with AO, who referred to the clinic of gynecology of the military medical clinical center of the Southern region of Odesa and in gynecology department of the City Clinical Hospital № 1 of Odesa in the last 8 years. All patients were divided in three basic groups depending on the volume of hemoperitoneum, revealed intraoperatively or established by noninvasive methods of examination.

I group was composed of 480 (54.0%) patients whose volume of hemoperitoneum did not exceed 200 ml and it was considered as minimum; II group consisted of 283 (31.8%) women with moderate intraperitoneal hemorrhage ranged from 200 to 500 ml; III group was formed by 125 (14.1%) patients whose amount of blood in the abdomen exceeded 500 ml, we considered this hemorrhage as significant. The main group I consisted of IC group (treated conservatively) – 270 (30.4%) women whose attack of ovarian apoplexy was treated by drugs; and IL group (treated laparoscopically) – 210 (23.6%) patients whose main diagnostic and treating measure was laparoscopic intervention. Of the women who were subject to conservative therapy, 105 (38.8%) patients were given out-patient treatment; 108 (40.0%) patients of IC group after cessation of ovarian hemorrhage and obtaining the course of drug therapy during the period from 1 to 7 weeks were operated on laparoscopically for the diagnostic and therapeutic purpose in the so-called “cold” period. These patients were united in I”C”LC subgroup. The patients of IC group who could be followed up to fix long-term results of treatment, were united in ICLT subgroup.

In referring to the center patients were made general clinical, biochemical studies of the blood, urine, urotest for pregnancy, a bacterioscopic and bacteriological study of discharge from the vagina and cervical canal. Ultrasonic examination of the abdominal and small pelvis organs was made by the apparatus ALOKA-650 and SA-8000 SE, vaginal sensor with a frequency of 6.0-7.5 MHz.

Surgical intervention was performed either immediately after the establishment of the diagnosis of apoplexy of the ovary and hospitalization of the patient or after an attempt of the conservative treatment, and also in absence of the possibility to exclude another threatening acute surgical and gynecological pathology. Laparoscopy was performed employing the conventional procedure under the endotracheal anesthesia with the use of mono- and bipolar electro-surgical technology [2]. The women of III group were performed the retransfusion of the autologous blood intraoperatively employing our own developed procedure [4] in absence of contraindications. Statistical processing of the results obtained was made by the software Statistica 5.5 (Stat soft inc., the USA).

All ultrasonic images of the ovaries were divided into 3 types depending on the presence of dense and liquid components on the scan in the tumor-like formation. Type I – tumor-like formation with dense, solid, amorphous hyperechogenic contents. Type II –

reticulated or sponge-like pattern is noticeable with the filamentary strips, which pass in different directions against the dense, amorphous hypoechogenic background. Type III – the echogenic formation of the irregular shape was observed in the ovary from 20 to 35 mm in diameter with a slit-shaped cavity.

The volume of free liquid was determined with the aid of transvaginal echograms of the small pelvis made in the saggital plane, which were also divided into three types. Type 1 – the level of liquid does not rise above the internal opening of the uterus. Type 2 – the echogenic strip of liquid reaches the middle body of the uterus. Type 3 – the level of free liquid is at the level of the uterus body and higher.

RESULTS AND DISCUSSION

The age of the observed patients varied from 17 to 55 years (on an average – (28.3 ± 5.2)). Pelvic pain was a leading clinical symptom in all patients. Intense acute pain was more frequently encountered in patients with moderate and great blood loss (62.2 and 92.3% respectively). In 285 (70.0%) patients of II and III groups the pain attack appeared in the second phase of the menstrual cycle (MC), while in 324 (67.6%) patients of I group the disease developed in the middle of MC. The hospitalized patients of I group with the expressed pain syndrome – 287 (76.5%) women – were characterized by early reference for medical aid (during the first 2 years from the beginning of the attack).

When insignificant nagging pelvic pain and stable geodynamics with the medical aid was observed in reference to the centre, the conservative treatment of the formed cystic hemorrhagic formation of the ovary (CHFO) was carried out under the out-patient conditions. The general state of all women of I group was estimated as satisfactory. The average indices of hemodynamics and red blood in the patients of this group were similar: pulse – (72 ± 8) per 1 min, SAP- (124 ± 6) mm Hg, DAP – (70 ± 8) mm Hg, hemoglobin – (121 ± 16) g/l.

In the women of II group the pain syndrome had a persisting character and was intensified in time. More than half of these patients noted persistent irradiation of pain in the rectum and perineum. The state of the patients as those of I group, was estimated as satisfactory because of absence of the visible hemodynamic disturbances and changes in the red blood: pulse – (86 ± 8) per 1 min, SAP- (122 ± 6) mm Hg, DAP – (68 ± 8) mm Hg, hemoglobin – (118 ± 16) g/l.

The state of the patients of III group was estimated as satisfactory only in 5 (4.0%) patients, of moderate severity in 57 (45.5%) patients and severe – in

63 (50.4%). The average indices of hemodynamics and red blood in patients of III group were similar: pulse – (104±8) per 1 min, SAP – (87±6) mm Hg, DAP – (68±8) mm Hg, hemoglobin – (74±12) g/l.

According to the US data a linear dependence between the level of free liquid regarding the uterus and volume of hemoperitoneum was revealed intraoperatively ($r=0.63$, $p<0.05$). Thus, in 90 (43.3%) women, whose intraabdominal hemorrhage did not exceed 200 ml, were observed by echograms of the type 1, and in 63 (30.0%) cases of the IL group free liquid on the echograms was not revealed at all. In all cases of intraperitoneal hemorrhage with the volume more than 200 ml on the transvaginal echograms made in the saggital plane, a column of free liquid was fixed. In the women of II group the echograms of the type 2 – 198 (70.3%) cases were most frequently observed. When intraperitoneal hemorrhage reached more than 500 ml, all ultrasonic images were of the type 3. In 18 (14.4%) patients of III group US study revealed hyperechogenic free liquid with the echoheterogenic sections in the vesicouterine space and around the ovaries.

In 70.0% of women of I group with the significant pain attack ultrasonic image of CHFO corresponded to the type I. The echogram of the type II was encountered in the majority of cases – 80.0% – in the patients with insignificant pain syndrome who mostly had out-patient treatment. In 281 (68.9%) woman with moderate and significant hemoperitoneum there was observed the ultrasonic image of the type III.

On the whole in 792 (89.2%) patients the diagnosis of apoplexy of the ovary and intraperitoneal hemorrhage was made before surgical intervention on the basis of the clinical picture and US data. In the remaining cases – 92 (10.4%) it was necessary to perform diagnostic laparoscopy for confirming the diagnosis.

When according to the US data and laboratory indices the volume of the blood in the abdomen did not exceed 200 ml, the hemodynamically stable patients were started conservative treatment, accomplishing dynamic observation with the ultrasonic monitoring. The hemostatic therapy was the first to administer: etamzilat (dicinon), adroxon, menadione, the solution of calcium chloride, tranexam and aminocaproic acids. To reduce the intensity of pelvic pains non-steroid antipyretic drugs were administered – both in injections and rectal suppositories. When the pain attack peak has already passed and in refusal to be observed at the in-patient department, out-patient treatment with the obligatory medical examination and ultrasonic monitoring was administered on the following day.

After disappearance of danger of the prolonged intraperitoneal hemorrhage further out-patient therapeutic measures were taken, directed at the resolution of the formed CHFO. Taking into account the important role of the infectious inflammatory processes of the small pelvis organs in the development of the tumor-like processes of the ovaries as one of the probable sources of AO, we give antibacterial therapy from the moment of CHFO formation considering the revealed pathogenic agents. To block the pathologic secretion of the gonadotropic hormones the hormonal drugs were administered (combined oral contraceptives or synthetic progestins). According to our observations, up to 90% of CHFO regressed after the first period, which was controlled by the transvaginal US. In case of absence of CHFO regress more than 50% patients were performed laparoscopic intervention.

All patients of II and III groups as well as 210 women of IL group were subject to urgent laparoscopic intervention. The most frequently performed hemostatic operation was resection of the ovary – 477 (77.2%) interventions. In 65 (10.5%) cases the uterine appendages were removed on the side of affection because of the significant destruction of the ovarian tissue by the pathologic process or development of the suppurative inflammatory process in ovarian hematoma, which involved practically the entire ovarian tissue. Diagnostic laparoscopy was performed in case the cause of insignificant hemorrhage in the small pelvis and expressed pain syndrome was pathologic ovulation.

There was no revealed adhesive process during the operation in the small pelvis and abdominal cavity in 398 (64.5%) patients; I-II degree of the manifested adhesive process was found in 146 (23.6%) patients. The manifested adhesive process of the small pelvis organs of III-IV degree was present in 74 (11.9%) patients. The larger volume of intraperitoneal hemorrhage was observed more frequently in the patients in absence of adhesive process in ovarian hemorrhages than in the patients with the accompanying adhesive process. Thus, the average volume of hemoperitoneum found in the patients with AO, in absence of the adhesive process was (273.5±21.3) ml, while in the patients with the expressed adhesive process of the small pelvis organs it was (141.4±35.5) ml. The cause of AO in more than the half of the cases – 348 (56.3%) was the corpus luteum or cyst of the corpus luteum. A considerably less frequent cause of ovarian intraperitoneal hemorrhage was other benign tumors and tumor-like formations of the ovaries (serous, follicular, endometrioid cyst).

Besides hemostatic intervention on the ovarian tissue the majority of patients – 348 (56.3%) were performed additional surgical intervention to eliminate the accompanying pathology of the small pelvis organs. The average duration of the surgical intervention was (41.3±1.8) min – from 15 to 110 min. In the postoperative period the basic method of anesthetization was the application of nonsteroid analgesics during the first two days. After surgery the patients were in the hospital from 1 to 3 days, on an average (1.9±0.1) day.

During the operation the most frequent intraoperative finding in the patients of I“C”LC subgroup was the adhesive process of the small pelvis, caused by previous acute inflammatory diseases and open surgical intervention. The adhesive process of I-II degree was revealed in 18 (16.9%) patients of this group, and of III-IV degree – in 39 (36.4%) cases. The formation of persisting CHFO against the background of external endometriosis was detected in 35 (32.1%) women of this group, endometriosis of the peritoneum of I-II degree – in 19 (17.5%) patients, and of III-IV degree in 17 (15.7%) women of I“C”LC subgroup.

After obtaining the results of the histological study further antirelapse therapy was carried out taking into account the morphological structure of the source of ovarian hemorrhage. The monophasic low-dose combined oral contraceptives (COC) in the cyclic regimen from 3 to 12 mo, depending on the reproductive intentions of the patient were used for the prevention of relapses of apoplexy from the follicular cysts of the ovary. If the patient was revealed endometrioid cyst or endometriosis of other localization, the depot – drugs of the gonadotropin-releasing- hormone (aGnRH) agonists were obligatory used in the treatment for the period from 2 to 4 mo. After successful therapy by the preparations of aGnRH, depending on the reproductive intentions of the patient, the long-term therapy with COC or synthetic progestins was used. The latter (noretisteron acetate, didrogesteron) were administered to the patients with cysts of the corpus luteum. When the woman had reproductive intentions in the near

future there was used antirelapse therapy with didrogesteron (dufaston) given on the 16th day of MC with the daily dose of 20-40 mg for the period from 10 days to 6 mo. Every 6-9 mo of therapy with COC or synthetic progestins interruption in the hormonal therapy was made during the period from 3 to 5 mo. During the interruption there were used plant and vitamin preparations (remens, tocopherol acetate, gincohel), utilized for the regulation of the hormonal homeostasis of a woman.

We succeeded in following up the long-term results of treatment in 487 patients (of I group – 231 women, of II group – 144 patients and of III group – 53 patients). The long-term results of treatment of ICLT, IL and I“C”LC subgroups were observed in 58, 100 and 73 patients respectively. The average duration of the patients' follow up was 31.7 mo (from 12 to 47 mo). The long-term results of treatment of AO were evaluated according to the state of the woman's reproductive function and development of the disease relapse (Table1).

According to the data obtained, the greatest incidence of relapse of apoplexy of the ovary, formation of CHFO and most prolonged period of subfertility were observed in the women of ICLT subgroup. The desired uterine pregnancy began more frequently in the patients of IL, II and III groups – 74 (74.0%), 105 (72.7%) and 39 (73.8%) cases respectively. Within the period of the observation 34 (58.6%) women conceived of those treated conservatively. In the subgroup I“C”LC two thirds of the observed patients conceived – 45 (61.6%). Reduction in the reproductive function in the women of this subgroup is explained by high rate of the extensive adhesive process, observed before the operation. The average period between the treatment of AO and the desired pregnancy was approximately identical in laparoscopically operated women and made 7.5; 7.4; 7.5; 7.8 mo. For IL, I“C”LC, II and III groups respectively, and in women ICLT subgroup this index increased to 9.5 mo.

Relapse of ovarian hemorrhage in the form of CHFO formation was observed in 14 (24.1%) patients of ICLT subgroup, in 21 (14.5%) women of II

Table 1. Long-term results of treatment of apoplexy of the ovary.

The indices investigated	I group, n = 231			II group, n=144	III group, n=53
	IK group, n=58	IL group, n=100	I“C”LC group, n=73		
Reproductive function:					
- they became pregnant	34 (58.6%)	74 (74.0%)	45 (61.6%)	105 (72.7%)	39 (73.8%)
- the period of subfertility, mo	9.5	7.5	7.4	7.5	7.8
Relapse of apoplexy of the ovary and formation of CHFO	14 (24.1%)	-	-	21 (14.5%)	8 (15.0%)

group and in 8 (15.0%) patients of III group. Within the period of the observation of AO and CHFO relapses were not observed in patients of IL and I“C”LT group. 3 (5.1%) patients of ICLT subgroups had to be performed laparoscopic intervention. AO was controlled conservatively in the remaining patients; 8 (13.7%) patients of ICLT subgroup agreed to diagnostic laparoscopy in a year after AO attack due to recurrence of the cystic formations, during which 5 women were revealed the adhesive process of the II-III degree of extension, 4 had external endometriosis of II degree.

CONCLUSIONS

Thus, the manifestation of the clinical symptoms in apoplexy of the ovaries depends on the volume of intraperitoneal hemorrhage. The data analysis of transvaginal echography allows to determine quantitatively, with a high degree of accuracy the volume

of intraabdominal hemorrhage and the morphological state of the affected ovary. Noninvasive diagnosis of the volume of hemoperitoneum in AO is used for differentiated selection of patients for the conservative or surgical treatment. Taking into account the fact that the adhesive process and endometriosis of the small pelvis peritoneum frequently accompanies ovarian hemorrhages, especially those clinical forms, which are subject to the conservative treatment (hemoperitoneum up to 200 ml), they can be one of the most probable causes of AO. Taking into account this, laparoscopy is a “gold standard” not only in diagnosis and treatment of AO, but also in prevention of possible ovarian hemorrhages. The application of laparoscopy as a main therapeutic and prophylactic method in AO allows to preserve and sometimes to restore reproductive function in almost 4 of 5 women with AO and reduce the rate of AO and CHFO relapse development.

REFERENCES

1. Likhachev V. *Prakticheskaya ginekologiya s neotlozhnyimi sostoyaniyami: rukovodstvo dlya vrachey* [Practical gynecology with urgent conditions: a guide for doctors]. Moscow: MIO; 2013, p. 538-540. (In Russian). ISBN: 978-5-8948-1924-2
2. Zaporozhan V.M., Grubnik V.V., Grubnik Yu.V., et al. In: *Endoskopichna khirurgiia: navchalnyi posibnyk* [Endoscopic surgery: a textbook]. All-Ukrainian specialized publishing house “Medicine”. 2019;22.2:455-460. (In Ukrainian). ISBN: 978-617-505-733-9
3. Gladchuk I.Z., Volyanskaya A.G., Nazarenko O. *Suchasni diahnostychni ta likuvalni pidkhody pry apopleksii yaiechnykyv* [Modern diagnostic and therapeutic approaches in ovarian apoplexy]. *Bulletin of marine medicine*. 2015;(2):112–117. (In Ukrainian). URI: <http://repo.odmu.edu.ua:80/xmlui/handle/123456789/4590>
4. Gladchuk I.Z., Kashtalyan M.A., Nazarenko O.Ya., Yakimenko O.V. *Sposib reinfuzii avtokrovi z cherevnoi porozhnyny pry laparoskopichnii hinekolohichnii operatsii* [Method of reinfusion of autologous blood from abdominal cavity during laparoscopic gynecological operation]. Declarative patent of Ukraine for the invention, № 22716, UA, IPC6:A61B17/00. Applicant and patent owner Odessa State Medical University. № u 2006 13335. 2007, №5. (In Ukrainian).
5. Akihiro Takeda, Shiori Tsuge, Mayu Shibata et al. Gasless laparoendoscopic single-site surgery with intraoperative autologous blood transfusion for management of ectopic pregnancy with significant hemoperitoneum: a retrospective observational study. *Gynecological Surgery*. 2019; 16 (1): 1-8. DOI:10.1186/s10397-019-1058-8
6. Medvediev M.V., Malvasi A., Tinelli A. Hemorrhagic corpus luteum: C. update. *Turk J Obstet Gynecol*. 2020; 17(4): 300–309. DOI:10.4274/tjod.galenos.2020.40359 <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7731611/>
7. Chethalan P., Garg R. Sonographic Spectrum of Hemorrhagic Cysts of the Ovary on Trans-Vaginal Sonography: A Study of 50 Cases. *International Journal of Science and Research (IJSR)*. 2017; 6 (8): 318-321. ISSN (Online): 2319-7064 https://www.ijsr.net/get_abstract.php?paper_id=ART20175913
8. Bottomley C., Bourne T. Diagnosis and management of ovarian cyst accidents. *Best Pract Res Clin Obstet Gynaecol*. 2009; 17: 21-23. DOI: 10.1016/j.bpobgyn.2009.02.001 <https://pubmed.ncbi.nlm.nih.gov/19299205/>

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CONFLICT OF INTEREST

Authors declare no conflict of interest.

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