Early diagnosis of maxillary carcinoma

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SUMMARY

Problems of early diagnosis of maxillary carcinoma are discussed and symptomatology of early and relatively early cases is fully presented. In cases which might be suspected of being malignant thoughtfull attention to all details of examination and carefull evaluation of seemingly insignificant symptoms and signs are of greatest importance. All methods of early detection of antral cancer are evaluated. The most valuable from among them are: tomography, including panoramic tomography, and sinoscopy. Measures which should be taken to shorten the interval between symptom onset and the definite diagnosis of maxillary carcinoma are specified.

EPITHELIAL malignant tumors of paranasal sinuses represent a great majority of malignancies in that localisation (in our clinical material 76% of 220 cases. Szpunar et al., 1972). It is well known that squamous cell carcinoma is found in 75-80% of these epithelial tumors. There is little doubt that all discussion on early diagnosis of maxillary malignancies should be concentrated on diagnosis of squamous carcinoma.

It is generally accepted that squamous carcinoma of the maxillary sinus arises from metaplastic epithelium, being usually the result of some damage to the normal respiratory epithelium by episodes of chronic sinusitis.

In a considerable percentage of cases the patients relate a history of previous chronic sinusitis and chronic inflammatory process is still active at the time of development of malignancy. In such a case the onset of carcinoma is obviously insidious because it is masked by preexisting symptoms of sinusitis. Early symptoms of antral carcinoma are here as a rule thought to be connected with sinus infection. The relative infrequency of antral carcinoma in relation to chronic sinusitis makes any form of screening of incipient malignancy in all cases of chronic sinusitis a very difficult problem.

In a case without active infection of the maxillary sinus the development of carcinoma proceeds at first quite symptomless till the tumor attains a certain size. It has been emphasized by Capps (1950) that malignant disease remains localized longer in the maxillary sinus than elswhere in the respiratory tract, except for the larynx.

Early symptomatology of antral carcinoma depends, to a great extent, on the

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location of malignant infiltration in one of the antral walls. Its first symptoms, apparently trivial, are usually confused with those of chronic sinusitis, neurologic disturbances referring to the maxillary nerve or of dental troubles.

The value of early diagnosis of antral carcinoma and its close relation to the considerable increase in survival rate cannot be overstressed. Yet, early diagnosis presents here great difficulties as it depends on careful evaluation of all, even seemingly insignificant symptoms and signs. Thus, in cases which might be suspected of being malignant thoughtful attention to all details of examination is extremely important.

In practice, right evaluation of symptoms pertaining to antral carcinoma by the patient himself and by the first consulting physician leaves much to be desired. As a result, in a great majority of cases a patient is accepted for the definite treatment at an advanced or very advanced stage of malignancy. According to Cranmer (1953) the average patient with antral carcinoma first consults his physician 3 months after symptom onset and is seen for definite therapy 4½ months later what makes 7½ months of delay. Our data are in a good agreement with these figures.

This problem is not specific for cancer of the maxillary sinus. From experiences of the Kraków Oncologic Institute it follows that the average patient with cancer of oral cavity is accepted for treatment 6 months after the onset of his first symptom (Skolyszewski). And yet neoplasms of this localisation have much better chances for earlier detection than antral carcinoma.

In such circumstances, only a general educational campaign, familiarizing the general practitioner and general population with early symptoms and signs of paranasal malignancies can make people seek earlier medical attention and not neglect the warning signs. Then, immediate investigation by experienced specialists, with all disposable means should be undertaken. In the first place, rhinologists should develop a much higher index of suspicion about apparently trivial or insignificant symptoms that may, in certain circumstances, point to a possible diagnosis of antral carcinoma.

METHODS OF EARLY DETECTION OF ANTRAL CARCINOMA

A. DETAILED HISTORY-TAKING AND ATTENTION TO TYPICAL EARLY SYMPTOMS AND SIGNS:

a. *Functional disturbances of the maxillary nerve:*

1. Facial pain

It is always unilateral. At first attacks of atypical facial neuralgia of slight intensity usually appear, then the pain may be dull and persistent, intensified at night or on lying down.

2. Toothache is often rather vague and not exactly localized to a certain tooth.

METHODS OF EARLY DETECTION OF ANTRAL CARCINOMA

A. Detailed history-taking and attention to early symptoms and sings
   a. Functional disturbances of the maxillary nerve
      1. facial pain
      2. toothache
      3. paresthesia or hypesthesia of the cheek
   b. Dental troubles
   c. Epistaxis
   d. Lacrimal disturbances
   e. Nasal obstruction and discharge
B. Radiologic diagnostics
      1. erosion or destruction of a bony wall
      2. irregularity of soft tissue outlines
      3. increased density of the sinus
   a. Standart X-ray pictures
   b. Tomography
         1. frontal
         2. sagittal
         3. transverse
   c. Panoramic tomography / pantomography / of the maxilla
   d. Radiopaque studies
C. Cytologic study of antral washings
D. Sinuscopy
E. Exploration of the antrum

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3. Paresthesia or hypesthesia of the cheek, over the distribution of the maxillary nerve.

Right evaluation of this group of symptoms is of great importance to very early diagnosis of antral cancer as they may hint at incipient malignant infiltration of the antral mucosa, which happens to involve a small nerve branch (rami alveolares ant. med. et post. nervi maxillaris). It applies, in the first place, to attacks of atypical facial neuralgia of small intensity or to vague toothache.

Persistent neuralgic pain or some disturbances of sensibility, strictly localized to a small area of the skin of the cheeck, usually point to the involvement of the main nerve trunk in the infraorbital canal. Sometimes, this may by a relatively early sign if a tumor arises from the superior wall, just around the infraorbital canal. It is obvious that intensive pain over the face is usually a late symptom of advanced malignancy, with extensive destruction of antral walls.

b. *Dental troubles*

With exception of toothache, which may be a very early symptom, such dental troubles as loosening of the tooth or teeth, slight gingival swelling or insignificant bulging of the alveolar process, which makes the wearing of dentures unconfortable, give evidence of moderate destruction of the inferior antral wall. Thus, they are only relatively early signs. Nevertheless, they have great diagnostic value since the results of surgical treatment of antral carcinoma of inferior location, not advanced, constrasts very favourably with those of malignancies of other localization. If oral and dental surgeons were thoroughly familiar with these symptoms the overall results of the treatment of antral carcinoma would be much better.

c. *Epistaxis*

Insignificant nose-bleeding or admixture of blood to nasal discharge may appear in a relatively early stage of antral cancer, being a sign of ulceration of the mucosa. More copious bleeding occurring in a case of apparent antral cancer is suggestive of an advanced tumor, usually invading the nasal cavity.

d. *Lacrimal disturbances* (epiphora)

It is rather uncommon but very important sign of early antral carcinoma arising from the medial or superomedial wall, close to the nasolacrimal canal. It is always important to ascertain the presence or absence of this symptom in any case suspected of antral malignancy.

e. *Unilateral nasal obstruction and pathologic nasal discharge* (sometimes blood-tinged)

These symptoms may occur in rather early stages of antral cancer. They evidence the presence of inflammation or infection of the mucosa around the tumor. Except for repeated admixture of blood in discharge these symptoms are indistinguishable from those of chronic sinusitis.

It is very important that any patient, especially a middle-aged one, with even a slightest possibility of having antral malignancy should be specifically questionned about all the above-mentioned symptoms and signs.

B. RADIOLOGIC DIAGNOSTICS

Radiologic examination is of greatest importance in early diagnosis of antral malignancies. Radiologic diagnosis of antral cancer is based on following findings:

1. Erosion or destruction of a bony wall.

It is doubtless the most important radiologic sign of antral malignancy which should be diligently sought for with the use of best available radiologic techniques. Admittedly, incipient antral carcinoma may present, a small infiltration of the mucosa, not invading the periosteum nor adjoining bone. Still, some erosion of a bony wall usually occurs in the development of the tumor. In our experience, any erosion or minor destruction ("fading") of an antral wall, shown in a reliable

tomographic picture, represents a most important and, at the same-time, comparatively easily detectable sign of early antral cancer. All suspicious tomographic changes in the bony contours of any antral wall should be viewed upon as malignant unless proved otherwise.

2. Irregularity of soft tissue outlines (usually a soft tissue mass).

Solely on the ground of a X-ray picture it is virtually impossible to distinguish a small neoplasm from a mucosal swelling commonly occuring in chronic sinusitis or from a benign tumor. But, together with other suspicious signs it may be of value as it helps to determine the limits of the tumor.

3. Increased density (cloudiness) of the sinus.

This is an unspecific sign which may be taken into consideration as suspicious of malignancy only in certain circumstances e.g. if inflammatory process in the antrum can be excluded or if there is a suspicion of changes in the bony contour of the sinus.

a. Standard antero-posterior projections.

Generally, they are not suitable for early diagnosis of antral cancer. If the picture is completely normal there are minimal chances of early malignancy taking place in the maxillary sinus. But, on a standard X-ray, differentiation of an inflammatory change from relatively early malignancy is only rarely possible since small degrees of bone erosion pass here often undetected. On the other hand, in more advanced antral cancer radiologic signs of destruction of bony walls are very often shown on standard X-rays (in 66% of all cases according to Hemenway and Lindsay) (1959).

b. Tomographic pictures of the maxillary sinus.

They should be taken in all three projections from which the frontal one is doubtless the most valuable in early diagnosis of malignancy (Szpunar, 1964). This projection best allows to detect small degrees of bone erosion of four antral walls. Sagittal tomograms are best suited for visualisation of the posterior antral wall and its possible destruction. Unfortunately, involvement and destruction of the posterior wall is a typical sign of an advanced neoplasm, invading the sphenomaxillary fossa. Theoretically, incipient antral cancer may also arise from the posterior wall but no such a case has ever been published or mentioned in literature. Recently we saw a case of moderately advanced carcinoma arising just from the posterior antral wall.
Tomography in the transverse plane can also be of help in some cases.

c. Panoramic tomography (pantomography) of the maxilla.

This method has been introduced by Shramek and Rappaport in 1969 for early detection of antral malignancies. We have started to use this method and we

believe that is has considerable advantages over other tomographic methods. Apparently it is best suited for detection of incipient malignant changes in the inferior antral wall. Its value as a method of screening for detection of very early antral cancer, as suggested by Shramek and Rappaport, is yet to be proved.

d. Contrast radiography of the maxillary sinus.

Radiopaque studies have been mentioned by some authors as a valuable method of early diagnosis of antral malignancies, especially in differentiation from benign tumors. There are, however, some disadvantages of contrast radiography: technical difficulties in obtaining complete filling of sinus and frequent filling defects due to mucosal swelling or secretions, which are sometimes almost impossible to be distinguished from a tumor.

C. CYTOLOGIC STUDY OF ANTRAL WASHINGS WITH PAPANICOLAU'S STAINS

According to Cranner (1953) the results of this method are uniformly positive when the tumor is obvious but often negative when it is not evident. Also in the other author's opinion it is not a fully reliable method. Nevertheless, it may be an useful adjunct in early diagnosis of antral cancer.

D. SINOSCOPY

It represents a real step forward in early diagnostics of antral malignancies. The value of sinoscopy in early detection of maxillary malignancies has been first stressed by Timm (1956). Experiences of many authors in this field have proved that this method sometimes allows to discover very early cases of antral cancer. Still, the number of such favourable cases in the practice of even most experienced men is very small.
Unfortunately, it does not seem probable that this so valuable method could gain, in near future, a very wide acceptance in the otolaryngologic practice. The reasons for it are following:

1. Sinoscopy requires a refined equipment and also a great skill and experience of a surgeon in interpretation of endoscopic pictures of the maxillary sinus.

2. This small intervention is not always well tolerated by the patients and that is why indications for it have to be rather limited.

E. EXPLORATION OF THE ANTRUM

Surgical opening of the antrum by canine fossa approach is most often a decisive diagnostic method in early antral cancer. All the above-mentionned symptoms and signs and also diagnostic methods only raise or strengthen a suspicion of antral malignancy but a certain diagnosis is not made till the antrum is explored and adequate biopsy is taken. Only then the presence of a malignant disease is confirmed or disproved.

But Caldwell-Luc operation is also indicated in seemingly benign conditions of the maxillary sinus which fail to resolve completely under appropriate therapy. It applies, in the first place, to chronic sinusitis, especially in a middle-aged patient, whose symptoms persist or recur in spite of adequate and consequent treatment. In such cases systematic explorations of the antrum represent a kind of screening measure, whose value consists in affording a real possibility of making a diagnosis of early antral cancer. This operation brings no harm to the patient, even if the presence of malignancy is disproved since removal of irreversible mucosal changes usually makes inflammatory process definitely heal.

We come now to an important question: what is generally meant by the term: early diagnosis of antral carcinoma?
It is clear that the problems of antral precancerous lesions and of carcinoma in situ have virtually only theoretical interest. Even cases showing small malignant infiltration of the sinal mucosa, not invading the periosteum nor bone, can be discovered rather accidentally, usually by sinoscopy. We have not come across any case of antral carcinoma which would not show any slight bone erosion in tomographic pictures. So, generally speaking, earliest antral carcinoma which can be diagnosed presents a relatively small tumor, usually with some erosion of an adjoining bony wall. Gibb (1957) has defined as early antral carcinoma a tumor of 4 cm of diameter or less. The assumption, however, that when a tumor is small it is an early one and that where a tumor has extended into adjoining tissue it is late, is only partially justified (Denoix, 1974).

Diagnosis of such a small tumor is only possible when great attention to early symptoms and signs is paid in a considerable clinical case-material and all disposable diagnostic measures are applied. The rather rare occurence of diagnosed early cases of antral carcinoma is reflected in the TNM classification of antral cancer, according to Sisson et al. (1963). Here T1 also includes infiltration of the anterior palatal wall, which represents rather moderately developped malignant process, extended beyond the antral wall. Ireland and Bryce (1966) found the malignant process strictly limited to the antrum only in 3% of their cases.

What is the future of early diagnostics of antral malignancies?

In all probability, paying more attention to early symptoms and signs of antral cancer by general practitioners, dental surgeons and, last but not least, by rhinologists, commoner use of more refined diagnostic measures as sinoscopy, pantomography, cytology of antral washings etc., combined with systematic exploration of the antrum in all, even slightly suspicious cases, will markedly shorten the interval between symptom onset and the definite diagnosis of antral carcinoma. This will allow to see for treatment some quite early cases and much more frequently the less advanced ones, which fact will certainly improve, to a great extent, the results of treatment of antral carcinoma.

ZUSAMMENFASSUNG

Die Probleme der Früherfassung des Kieferhöhlenkarzinomes werden besprochen und Symptomatologie der Frühfällen wird eingehend dargestellt. In Fällen, die nur den Verdacht der Malignität erwecken könnten, die Aufmerksamkeit auf alle Untersuchungsdetails und genaue Bewertung aller Symptome, auch solcher, die anscheinend nicht als besonders verdächtig gelten, sind angezeigt.

Alle diagnostische Methoden, die der Früherfassung der Kieferhöhlenkarzinomes dienen können, werden besprochen. Von denen als wichtigsten werden Schichtaufnahmen, einschliesslich der Panoramakieferaufnahmen, und Sinuskopie betrachtet. Auch Schritte, die eingeleitet werden sollen, um das Interwall zwischen dem Symptombeginn und der Diagnosestellung des Kieferhöhlenkarzinomes möglichst zu verkürzen, werden erörtert.

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